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and
OTORHINOLARYNGOLOGY

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CONRAD BERENS, M.D.
Editor-in-Chief for Ophthalmology

CHEVALIER L. JACKSON, M.D.
Editor-in-Chief for Otorhinolaryngology

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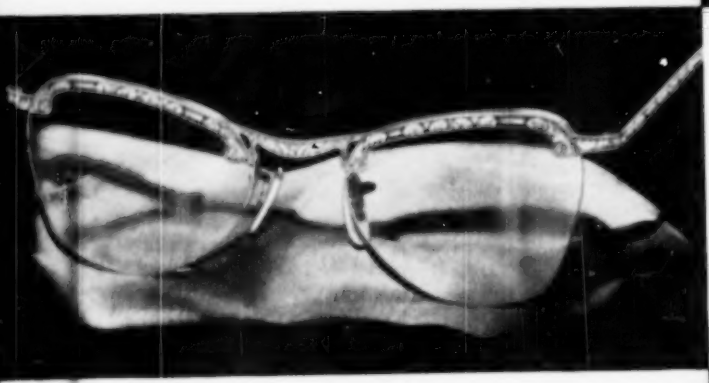

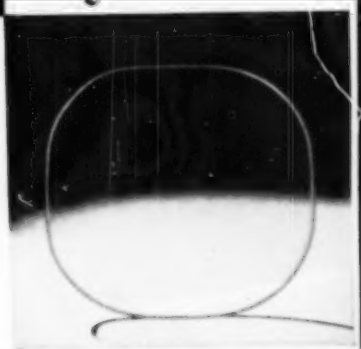

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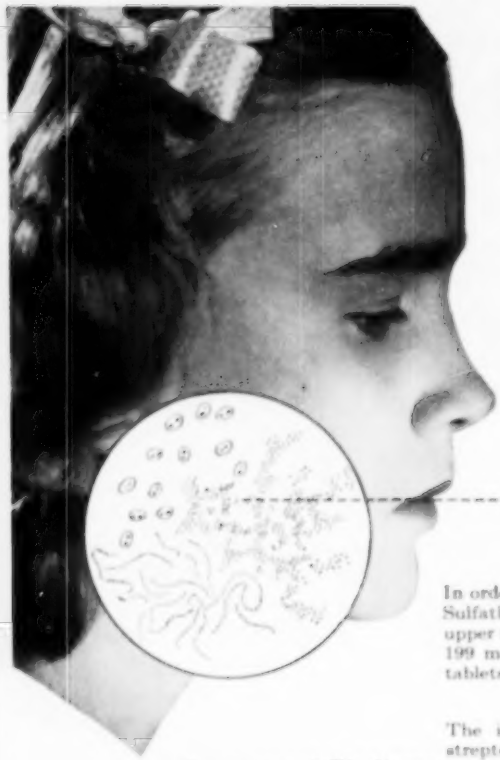

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*Neiman, I. S.: Prophylactic Value of Sulfathiazole. Archives of Otolaryn. 47:159-164 (Feb.) 1948.

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FOREWORD

THE Quarterly Review of Ophthalmology and Allied Sciences and the Quarterly Review of Otorhinolaryngology and Broncho-Esophagology have been combined and will now be published under the title QUARTERLY REVIEW OF OPHTHALMOLOGY AND OTORHINOLARYNGOLOGY. Each issue will include all of the sections heretofore published in the separate journals. Dr. Conrad Berens and Dr. Chevalier L. Jackson will continue as Editors-in-Chief and the Editorial Board will include the entire roster of distinguished authorities who have contributed so much to the progress of the individual Reviews published to date.

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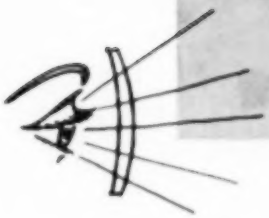

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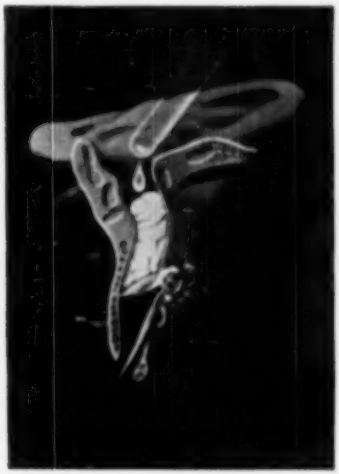
Five-fold attack against

Middle Ear Disease

External Ear Disease



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1. Holder, H. G., and MacKay, E. M.: Mil. Surg. 90:509-518 (May) 1942.
2. Holder, H. G., and MacKay, E. M.: Surgery 13:677-682 (May) 1943.

DEVIATIONS

and Frank S. Caprio, M.D.

Homosexuality
4. A Case of Erythrophobia (Blushing) Associated with Repressed Homosexuality
B. Female Homosexuality
1. Dream Analysis of a Lesbian
2. The Psychobiography of a Lesbian
3. Deep Analysis of a Married Lesbian
4. A Case of Anxiety-Hysteria in a Lesbian
V. Incest
A. An Incestuous Relationship Between Brother and Sister in Adult Life
B. Frigidity in a Married Woman Impregnated by Her Father During Adolescence
VI. Exhibitionism
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A. A Case of Sado-Masochism
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XI. Coprophilia: A Case of Coprophilia Associated with a Partialism for Women's Buttocks
XII. Urolagnia: The Psychogenesis of Urolagnia in a Case of Multiple Paraphilias
XIII. Zoophilia: Anxiety Neurosis Associated with Zoophilia
XIV. Miscellaneous Sexual Deviations

A. Coprolalia
B. Mixoscopia
C. Pygmalionism
D. Cannibalistic Traits and Vampirism
E. Kleptomania
F. Paedophilia
G. Necrophilia and Pyromania
H. Troilism (Sexual Relations Involving Three People)
I. Pluralism
J. Autoeroticism (Compulsive Masturbation)
K. Fetishism (Hair-clipping)
L. Antifetishism
M. Partialism
N. Promiscuity and Nymphomania
O. Don Juanism and Satyriasis
P. Pederasty (Sodomy)
Q. Fellatio and Cunnilingus
S. Sexual Apathy (in Men)
R. Mysophilia and Ospbresiophilia
T. Narcism and Prudery (in Women)
U. Philandering, Bigamy and Polyandry
V. Sadism (Sexuality and Crime)
W. Rape
X. Pornography
Y. Prostitution, Pandering and White Slavery

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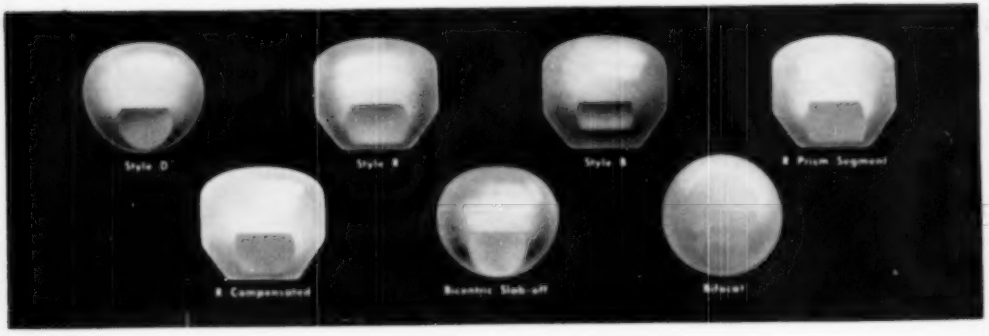

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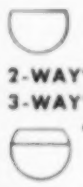

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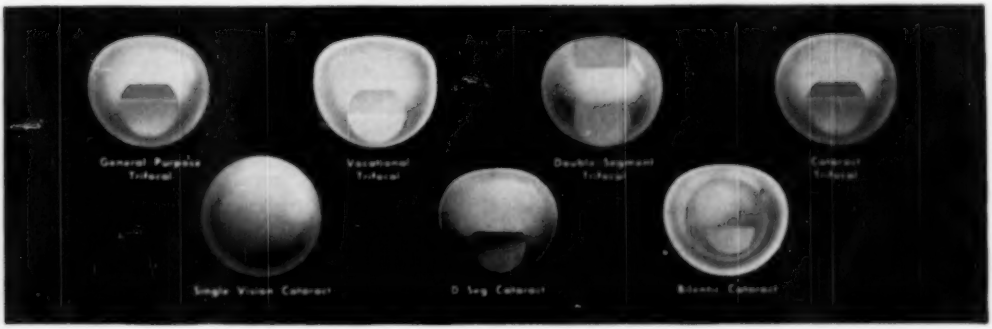

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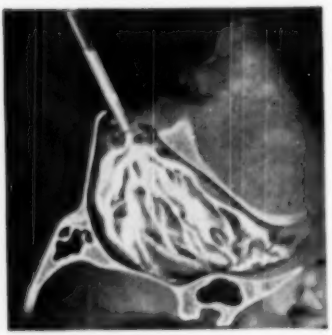

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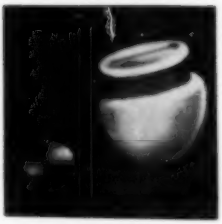

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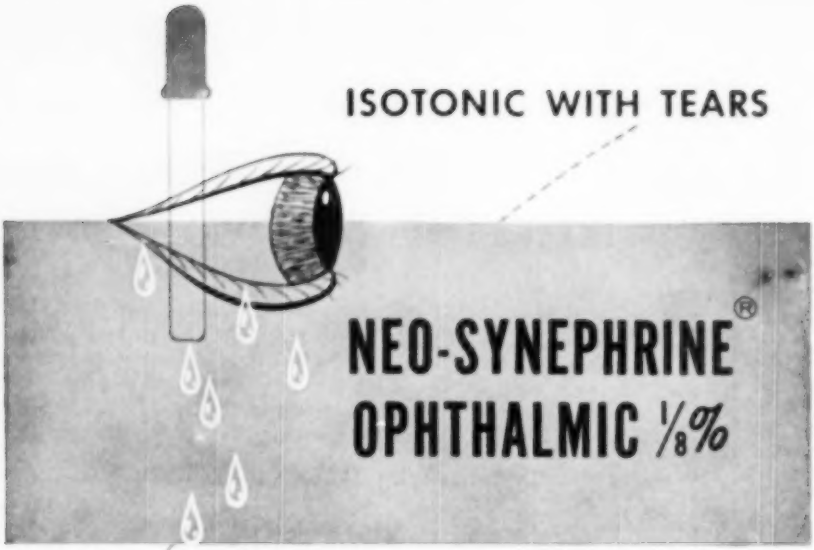

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Quarterly Review
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Vol. 6 No. 1 March 1950

OPHTHALMOLOGY

Optics, Physiology and Psychology of Vision

A Comparison of Electrical and Psychophysical Determinations of the Spectral Sensitivity of the Human Eye. *Lorrin A. Riggs, Richard N. Berry, and Matthew Wagner, Brown University.* J. Opt. Soc. Am. 39: 427, June 1949.

By means of an electrode mounted on a contact lens the electrical responses of the retina to stimulation by filtered lights of various dominant wave lengths were measured. The very slight difference in electrical potential between the cornea and the stimulated retina was electronically amplified, and the output fed to a loop oscillograph galvanometer which photographically traced the relative positive potential of the cornea above the ground potential of the retina. (An electrode applied to a point on the forehead was the ground potential.) The potential differences measured ranged from 58 to 500 microvolts, approximately.

The spectral sensitivity data were computed in terms of the intensity of stimulation necessary at each wave length to arouse an electrical response of a given small magnitude. Two sets of data were obtained, for dark-adapted and for light-adapted eyes. The responses for the right eyes of five observers were measured.

Comparable data in parallel experiments were obtained by psychophysical experiments of the classic type, using the same filter combinations and methods of computation as for the electrical experiments. It was found that the electrical data, both for photopic and scotopic eyes, agreed much more closely with the psychophysically determined scotopic sensitivity curve than with the photopic. Lights of shorter wavelength, in the blue region of the spectrum, were found to be slightly

more effective in creating electrical response than predicted by the scotopic sensitivity curve.

Bifocal Lenses. *Ralph H. Pino.* Presented at the American Academy of Ophthalmology and Otolaryngology, 1949.

Only parallel rays of light passing through a lens and equidistant from the optical center meet at the same point on the optic axis. All other parallel rays meet at other points, and this produces aberration.

The further the rays of light pass through the lens from the optical center, the greater the aberration, and the stronger the lens the greater the aberration.

The average non-glass wearing individual reads (according to Helmholtz) with eyes turned down about 15 degrees, or about 7 mm. The further the patient looks down from the optical center the greater the aberration. This becomes serious especially in aphacic lenses in spite of corrected curves.

The type of bifocal therefore, that produces the least astigmatic or spherical aberration is the one that forces the eye downward least below the distance optical center. Several diopters of cylinder may be produced that the prescription does not call for and the patient can not wear. The non-flat top type of Ultex (they make a flat top) produces the greater aberration. The Kryptok type produces less aberration, and any flat top the least, usually a negligible amount.—*Author's abstract.*

Psychological Aspects of Amblyopia. *Louis Wekstein, Boston, Mass.* Am. J. Optometr. and Arch. Am. Acad. Optometr. 26: 511–18, Dec. 1949.

The psychological view of amblyopia is configurationistic and does not fail to take other than a psychogenic view into consideration. Teamwork between the various disciplines is required to reach this goal.

In the literature on amblyopia, the following major causes have been set forth: opacities, scars and turbidities; toxic substances, malnutrition and local macular pathology. The author maintains that in each of these instances the patient's personality is greatly threatened and the anxiety factor is present. He infers that recovery may be due to alleviation of anxiety and not to physical treatment alone; that where the anxiety and threat have not been removed the amblyopia persists despite seemingly successful therapy by the physician; that only certain individuals develop amblyopia although many are exposed to the same conditions.

A differentiation between amblyopia and malingering, suggestions for treatment and research, and the psychoanalytical conception of amblyopia is included.—*Author's abstract.*

Experiment on the Nature of the Retinal Image. *James H. Grout, Chicago, Ill.* Am. J. Optometr. and Arch. Am. Acad. Optometr. 26: 427–38, Oct. 1949.

The experiment investigates physical imagery in the eye. The aberrations of the eye are described, which aberrations might lead to the belief that imagery, in the classical sense, is an impossiblity. The short focal length system, however, accounts for very well-formed images through photographic and microscopic study. In this connection, images of letters but .0022 mm. in height were legible when magnified to the same size as they would appear in space.

The next step in the experiment was to show a relationship between the degrees of blur created by the superimposition of lenses before the cornea of the experimental eye and that created by the addition of the same lense powers before an observer's eye. The results of this disclosed that the change in the degree of blur produced in the retinal image was a great deal less than the degree of blur produced subjectively in the observer's visual acuity.

It would follow that the retinal image for any myope or astigmat, instead of being but a badly blurred patch of light, is actually considerably better than the subjectively projected image. Such facts may make for easier understanding of many of the phenomena we observe in the practice of optometry.

The Spherical Aberration of the Eye. *M. Koomen, R. Tousey, and R. Scolnik, Washington, D. C.* J. Opt. Soc. Am. 39: 370–376, May 1949.

In connection with some experimental work on night myopia, the authors measured the spherical aberration of their own eyes. Various centered annular apertures were placed over the eye pupil and the optimum spectacle correction for each zone was determined. The test object was a "double star" with the separation slightly greater than the minimum resolvable. An ingenious reflecting system used in conjunction with an additive phoroptor enabled control of accommodation.

The three eyes that were tested exhibited positive (undercorrected) spherical aberration. In other words, the eyes were relatively more myopic for annular zones farther from the center of the pupil, to an extent of 2 diopters in one case, at the pupil margin. Increasing accommodation was found to reduce the spherical aberration, and, in one case, under high accommodation, the spherical aberration became negative. Homatropine reduced the positive spherical aberration in two of the eyes examined, but failed to change the aberration curve of the third, merely shifting it in the direction of hyperopia.

A very interesting historical section is included in this paper, discussing aberration measurements made as long ago as 1801 by Thomas Young. The majority of eyes tested by various investigators has shown positive spherical aberration, but the magnitudes of the effect vary widely according to the technique used. The authors report a close relation between night myopia and spherical aberration measured by their method, which they hope to present in a future paper.

A Note on the Photo Pupil Reflex. *Jules de Launey, Washington, D. C.* J. Opt. Soc. Am. 39: 364, May 1949.

A preliminary study was made of the variation of pupil diameter with illumination of the retina. The experimental method involved the production of a specified stimulus on the retina and a photographic procedure to measure pupil diameter after the eye had had sufficient adaptation time. The stimulus consisted of a 2° circular disk of white light falling either on the fovea or 8° temporally to the fovea. The eye was dark adapted before each stimulus exposure. After ten or more seconds, an instantaneous flash photograph was taken, and measurements of pupil diameter obtained from a 2× enlargement.

Great care had to be exercised to rule out such factors as mechanical influences, psychic influences, ciliospinal reflex, orbicular reflex, etc. The result showed quite a dispersion in pupil diameter for the same eye under similar conditions at varying times.

The author concludes that the photo-pupil reflex is confined to the photopic range of illumination. He proposes the hypothesis that the photo-pupil reflex is essentially initiated by cone response. Due to the fact that the author is at present engaged in another field of research, he makes various suggestions for further investigation. For example, it would be interesting to test his hypothesis by investigating the photo-pupil reflex in a totally color-blind subject, particularly one who has a central scotoma and presumably possesses only rod vision.

Accommodation and Convergence Reflexes. *Edwin Forbes Tait, Norristown, Pa.* Presented at the American Academy of Ophthalmology and Otolaryngology, 1949.

The ocular stimulus-response mechanisms in accommodation and convergence can be considered as reflex in character. They are a mixture of congenital reflexes and postnatal conditioning. The experimental data support the concept that there are four basic stimulus-response systems in accommodation, and the same number in convergence.

Classification of the accommodation and convergence reflexes should be on the basis of the stimuli which produce them. If the classification were based, in the usual way, on the end results, it would lead to an endless series of subdivisions, useless from the standpoint of rational therapy.

Accommodation

Accommodation reflexes are apparently four in number and can be separated into functional and associative groups, as follows:

A. Functional.
   1. Tonic accommodation.
   2. Retinal accommodation.

B. Associative.
   1. Convergence accommodation.
   2. Proximal accommodation.

Tonic accommodation: This is the amount of accommodation constantly provided by the normal tonus of the ciliary muscle. The actual muscle tone does not vary greatly throughout life, but, due to lenticular sclerosis, the amount of tonic accommodation will vary from about 1.25 D. at age 10 to practically none at the age of 65 or 70. This, of course, is innervational in character, and excessive tonic innervation (ciliary muscle hypertonus) is the cause of much discomfort and is the only real reason for the use of cycloplegics. The primary stimulus for tonic accommodation is supplied by the centers and tracts which have to do with the maintenance of muscular tone in general. This tonic accommodation reflex forms, with the so-called retinal accommodation reflex, the two functional stimulus-response mechanisms necessary for satisfactory focusing of the eye.

Retinal accommodation: may be defined as the accommodation response to stimuli supplied by blurred retinal images. The amount of this response represents the amplitude of accommodation, and is, like the other reflexes, relative to the conditions of the test.

Convergence accommodation: This reflex together with the proximal accommodation reflex next discussed make up the associative accommodation responses which are usually present but which are not necessary for efficient ocular functioning. Convergence accommodation represents the accommodative activity stimulated by the use of convergence. This reflex is probably developed in the early years because of the constant and repeated simultaneous use of accommodation and convergence. As a typical learning process, the two functions tend to become associated, so that the stimulation of one will result in a response of the other, provided the second is free to respond.

Proximal accommodation: is apparently a subliminal conscious response, due to the nearness of the object at which the subject is gazing. The amount of accommodation supplied by this response is usually quite limited, but may, in occasional individuals, amount to several diopters.

Convergence

Stimulus-response mechanisms in convergence may also be classed in functional and associative groups, as follows:

A. Functional.
   1. Tonic vergence.
   2. Fusional vergence.

B. Associative.
   1. Accommodation convergence.
   2. Proximal convergence.

Tonic vergence represents the end effect of the distribution to the extraocular muscles of the reciprocal innervation originating in the tonic centers and tracts of the brain stem. If other effective stimuli for convergence are nonoperative, the resultant orthophoria or heterophoria represents the tonic vergence or the so-called basic position of the two visual axes relative to each other. Alterations in the position of the visual axes are accomplished by a modification in the distribution of tonic reciprocal innervation to the extraocular muscles.

Fusional vergence represents the modification of the tonic reciprocal innervation to the extraocular muscles in the interest of gaining or retaining single binocular vision. The primary stimulus source is the excitation of the perimacular or extramacular fusional receptors, and the response is measured practically by the prism vergence and recombination tests.

It is the constant stimulation of the retinal perimacular fusion receptors which initiates the fusional vergence reflexes which, in turn, compensate for inadequacies in the tonic vergence. The latter is represented by the esophoria, exophoria, hyperphoria, or cyclophoria for any given point of fixation when sources of innervation to the extraocular muscles other than those from the tonic centers are excluded. If the tonic vergence reflex does not make the individual orthophoric, his single binocular vision is retained by the stimulation of these perimacular receptors.

By utilizing the tonic vergence finding and the amplitude of fusional vergence, it is possible to develop a use-amplitude fraction for expressing the amount of the fusional vergence reflex which is in constant use for any given point of fixation. The use-amplitude fraction is, then, the amount of fusional vergence in any given direction, constantly in use, over the amplitude of prism vergence in that same direction. Studies of many cases indicate that only a certain portion of the fusional vergence amplitude may be used constantly without discomfort, that amount varying according to the type of the heterophoria and the visual demands.

Accommodation convergence is the modification produced in the distribution of reciprocal innervation to the extraocular muscles by the use of accommodation. It is the extent to which this reflex is operative that determines the amount of exophoria or esophoria at near. Inasmuch as this reflex is not necessary for efficient ocular functioning, the

amount of exophoria at the near point has no relation to comfort. Accommodation convergence is important only when it is excessive, creating an esphoria for near, as it then takes the place of the tonic convergence reflex as that which must be modified by the fusional process.

Proximal convergence is that which is stimulated by the nearness of objects in the absence of other effective stimuli and is usually not more than 3 or 4 prism diopters.—*Author's abstract.*

Differential Diagnosis and Treatment of Amblyopia. *S. Rodman Irvine, Beverly Hills, Cal.* Presented at the American Academy of Ophthalmology and Otolaryngology, 1949.

Application of the prism displacement test, based on the phi phenomenon, beta apparent movement, in study of amblyopia associated with strabismus and anisometropia has led to interesting observations on retinal inhibition, scotoma, projection and visual acuity. These were presented and their practical significance in diagnosis and treatment of amblyopia ex anopsia discussed.

For purposes of presentation amblyopia ex anopsia cases are divided into four groups, representing varying grades of severity. A fifth group of cases, apparent organic lesions of the macula, were compared with the amblyopia ex anopsia cases.

Group 1: severe amblyopes, with gross inability to fixate but with the eye held in the primary position show an area of relative inhibition between the disk and the macula, with a smaller absolute scotoma either adjoining the nasal side of the macula or on the temporal side of the disk. In the area of relative inhibition outside the absolute scotoma an image may be seen, but it is projected indefinitely. There is apparently a merging of factors of abnormal projection and inhibition in this area to account for the poor fixation and poor vision in this group of cases. The absence of fixed false projection, the variable inconstant strabismus, the strongly positive family history, and the early onset in infancy, all suggest that group 1 is an advanced grade of group 4 (amblyopia without strabismus) and that a congenital defect as well as simple disuse of the eye may be a factor in etiology.

Group 2: amblyopes with eccentric fixation, show the same type of centrocecal or cecocentral scotoma, but the false retinal projection in the area adjoining the absolute scotoma is firmly fixed as to directional value. In some cases the fixed false projection accounts for the eccentric position of the eye more than do the position and density of the scotoma, the patient preferring to fix in the eccentric position even though the vision is better in another position. These patients, like group 1, represent a severe form of amblyopia but strabismus factors are more definite. The fixed false projection makes it difficult to obtain good results by surgery, the eye tending to go back to the original position.

This can be judged by the tendency of the eye to turn under prisms so as to keep the image aligned on the same area of the retina.

Group 3: comprises cases of amblyopia with strabismus with relatively good ability to fixate. All amblyopes show increased amplitude of fixation movements as compared with patients having normal eyes or with cases of organic macular disease. Group 3 shows degrees of inhibition at the angle of squint varying from absolute scotoma to mild facultative inhibition. Infrequently there is a small scotoma touching the side of the macula involved in the angle of squint. Between the inhibition area at the angle and the macula, degrees of faulty projection are found varying from fixed false to indefinite projection.

Group 4: comprises amblyopia cases without apparent strabismus or with inconstant strabismus showing normal retinal projection outside the central inhibited area. Anisometropia is found in most cases. A facultative type of central or paracentral scotoma is usually present and a very small absolute scotoma rarely. The scotoma is too small to account for the lack of visual acuity. The relatively poor fixation is an important contributing factor. Retinal rivalry can be elicited and might afford a mechanism whereby the nondominant eye could be easily inhibited, preventing development of the fixation reflex. However, all patients with anisometropia do not develop amblyopia, and other factors, such as congenital defects, must be considered in the etiology.

Group 5: amblyopia resulting from macular pathology. The fixation reflex is relatively normal compared to that in amblyopia ex anopsia. Retinal projection is normal. The scotoma is large and readily demonstrable. Notwithstanding the larger size of the scotoma, the visual acuity is much greater. Congenital holes in the macula, in contrast to acquired lesions, produce visual disturbance simulating that seen in amblyopia ex anopsia; that is, the fixation reflex fails to develop.

The lack of visual acuity in amblyopia ex anopsia cannot be explained on the basis of the size of the scotoma, nor entirely on the basis of two-point resolving power. The area of inconstant inhibition surrounding the scotoma, inattention, poor fixation and faulty projection are also factors. This concept is brought out by the fact that certain amblyopes, particularly those with faulty projection and poor fixation, can identify single isolated letters much smaller than the smallest they can identify when seen in a group. Patients with normal projection and relatively good fixation, as those with moderate amblyopia without strabismus, or with organic scotoma, show less discrepancy between identification of single letters and letters in a group. The importance of the contributory factors emphasizes the need for special measures to train fixation and correct faulty projection in the treatment of amblyopia ex anopsia.—*Author's abstract.*

Anomalous Retinal Correspondence. *Thomas I. Duane, Redminster, Pa.* Presented at the American Academy of Ophthalmology and Otolaryngology, 1949.

Development of Anomalous Retinal Correspondence (ARC):

In the interest of maintaining single binocular vision at all ranges, mammals and the higher vertebrates evolved conjugate movements. This necessitated the development of a partial (50%) decussation at the optic chiasm and this, in turn, has given rise to corresponding points on the retinas. These are physiologic and not anatomic points.

The retinal elements which have common visual directions (subjective spatial values) are called corresponding points. NRC is related to the horopter. Diplopia occurs when the same object has two visual directions, e.g., when one eye is turned passively. Though each eye can be stimulated separately, NRC and ARC are binocular phenomena and this is the key word to all our thinking on this subject.

The physiologic single cyclopean eye is a purely subjective sensorial concept.

Development of Anomalous Retinal Correspondence (ARC):

NRC, which is a sensory adaptation to conjugate eye movements, may be disturbed, especially in early life, when the "tie-rod" connecting the two eyes at various sites of fixation is poorly or loosely established. ARC is a subjective adaptation to changed position of the corresponding points. It is established much like a conditioned reflex.

In order to fit ARC into the general scheme of the squint syndrome, the following outline is provided:

1. Stereopsis.
2. Depth preception (binocular).
3. Amplitude of fusion.
4. Single binocular vision.
5. Diplopia.
6. Suppression.
7. ARC.
8. Amblyopia ex anopsia.

Methods of Testing for ARC:

1. Objective position vs. subjective localization.
   a. Double image (red-green) test.
   b. Lancaster's red-green test.
   c. Synoptophore.
   d. Tschermak's apparatus.
2. Direct determination of the visual directions of the foveas.
   a. After image test (Bielschowsky).

Clinical Aspects:

ARC does not develop in all cases of squint even if they begin at an early age. The ARC may be adapted to the angle of squint (harmonious) or may not be thus adapted (unharmonious). ARC is frequently dependent on dissociation and fixation of the eyes.

Treatment:

The object is to disrupt the ARC and restore NRC.

1. Occlusion.
2. Normal position of the eyes (surgery).
3. Prisms.
4. Orthoptic exercises.

The relative effectiveness of these methods varies with the different schools of thought regarding the treatment for squint. If one studies the correspondence in all of his cases of squint, he can determine its role in his own methods of treatment. 3 references.—*Author's abstract.*

Ocular Psychoneuroses. *Edward P. Burch.* Presented at the American Academy of Ophthalmology and Otolaryngology, 1949.

There are fundamental psychologic and physiologic differences between conversion symptoms, vegetative neuroses, and psychogenic organic disease. We should restrict hysterical conversion phenomena to symptoms of the voluntary neuro-muscular and sensory perceptive system, and differentiate them from psychogenic symptoms which occur in vegetative organ systems, the functions of which are under the control of the autonomic nervous system.

A conversion symptom is a symbolic expression of a well-defined emotional content, an attempt at relief; although as Freud originally expressed it, these substitutive innervations never bring full relief. The symptoms express at the same time both the repressed emotion and its rejection. Because they do not fully relieve the tension, we have a pathologic condition.

A vegetative neurosis, such as emotional hypertension, is not an attempt to express emotion but is the physiologic accompaniment of constant or periodically recurring emotional states. The chronicity of an emotional tension alone is what makes such a condition morbid.

In considering ocular disturbances of psychogenic origin it would seem rational to divide them as follows:

I. Ocular Conversion Symptoms: 1) Blepharospasm; 2) Convergence spasm; 3) Asthenopia; 4) Photophobia; 5) Hysterical amblyopia and amaurosis.

II. Ocular Vegetative Neuroses: 1) Ciliary spasm; 2) Amaurosis fugax; 3) Central angiospastic retinopathy; 4) Migraine; 5) Glaucoma.

The Ocular Phenomena of Conversion Hysteria

There is hardly a sign or symptom of organic disease which hysteria cannot simulate. In the majority of cases diagnoses are made by exclusion of organic symptoms and signs alone. Seldom is any attempt made to determine in a positive sense the existence of hysteria.

Blepharospasm: This symptom may vary from the transient "blinking" of a nervous child to a severe and spastic closure of the lids. It is one of the most common of all ocular complaints in children, especially in early school years. In the absence of uncorrected refractive error, secondary conjunctivitis, etc., a careful history from the parent, with some sympathetic questioning and coincidental observation of the child, will reveal a background for conversion hysteria in a large number of cases. In the more severe forms of blepharospasm encountered in adults, one must often by proper psychiatric evaluation establish the positive diagnosis of hysteria before treatment, if it is to be successful, can be instituted.

Convergence Spasm: This is one of the more clearly defined ocular motor anomalies which may occur as a symptom in conversion hysteria. The disturbance usually represents an excess of convergence usually associated with a comparable excess of accommodation which becomes pathologic because of its duration in a susceptible psychoneurotic patient. One is not justified in pronouncing these patients incurable until all the possibilities of prolonged psychoanalysis have been explored. In the majority of instances severe convergence spasm is associated with other evidences of hysteria.

Asthenopia: This has become a waste basket of eye symptomatology and has been used to describe everything from unclassified headache, photophobia and eyestrain, to amblyopia of psychogenic origin. Lancaster has called attention to the rule that a psychoneurosis should never be diagnosed on negative evidence alone, and this applies particularly in the case of asthenopia. In the absence of uncorrected refractive error, muscular imbalance, etc. with positive evidence of psychoneurotic symptoms, asthenopia, like all forms of conversion hysteria, is extremely susceptible to cure by suggestion. But one must avoid the common pitfall of temporarily curing a symptom while completely neglecting its cause.

Photophobia: The exclusion of irreversible disease in severe photophobia is not difficult, but even more important in establishing the psychogenic origin of the symptom is a careful analysis of the patient's history and personality pattern. There is a frequent association of photophobia with blepharospasm, facial tic, and transient amblyopia from ciliary spasm. These associated symptoms and the photophobia itself can often be abolished by direction of the patient's attention away from his symptoms.

Hysterical amaurosis and amblyopia: Amblyopia is a much more common symptom of conversion hysteria than amaurosis. In the majority of cases in which the amblyopia is the dominant symptom there are, however, other complaints and symptoms which can be readily uncovered by psychiatric evaluation and which fit into the picture of hysteria. Briefly, the classical symptoms of hysterical amblyopia are the resigned attitude of the patient to his disability, the slow, hesitant reading of the Snellen test chart no matter what letters are chosen as minimum visual acuity by the patient, the typical tubular, sharp margined visual fields, found in almost all cases, and the marked amenability to suggestion resulting in rapid improvement in vision with only the most superficial psychotherapy. The most important single test is the visual field taken on the tangent screen at varying distances, with different test objects, with the production of the typical tubular field which is the same size in inches regardless of the distance at which the test is made. It is generally agreed that suggestion plays a most important part in the treatment of hysteria but it must be emphasized that the transient cure of a symptom by suggestion is by no means a cure of the underlying psychogenic factors producing the symptom. Cure by suggestion, therefore, is of more value as a diagnostic procedure than as a rational form of therapy.

Ocular Vegetative Neuroses: There is ample anatomic and physiologic evidence of the cortical control of the vegetative nervous system through the hypothalamus. The evidence clearly indicates that this portion of the brain contains important integrating mechanisms for the so-called vegetative function. Many of these mechanisms produce their effect by influencing lower subordinate complexes. In turn, the hypothalamus is undoubtedly under a certain measure of control by higher regions, including the cerebral cortex. From an ophthalmic point of view this is evidence of the cortical or emotional control of the vasomotor system, since most of the ocular vegetative neuroses are primarily vasomotor disturbances.

Ciliary Spasm: Relatively little has been written regarding the production of transient myopia by emotional disturbance such as fear, or anxiety states, and yet it is a relatively common phenomena. The disturbance is limited to young people and manifests itself as a periodic and transitory blurring of distance vision usually associated with prolonged reading. Visual loss may vary from very slight to as low as 20/200, and may last from a few minutes to days or even weeks at a time. The change in refraction may vary from 0.50 D to as much as 2.0 D. by manifest refraction and is characteristically altered by rest or by employment of the "fogging" method of refraction. The use of homatropine immediately abolishes or reduces the dioptric change, but the improvement is only temporary. Ciliary spasm is differentiated

from amaurosis fugax by the measurable change in the refractive power of the eye.

Amaurosis Fugax: This is a true vegetative neurosis which is vasomotor in origin. It includes all those ocular disturbances such as periodic dimness of vision and "blackout," which are associated with autonomic instability but leave no permanent or visible organic change. It is frequently a part of the symptom complex of neurocirculatory asthenia. Exhaustive ocular examinations reveal no evidence of organic disturbance sufficient to account for the symptom, but even causal observation will reveal in most cases other evidences of vasomotor instability. Careful evaluation of psychogenic factors will frequently reveal marked anxiety states, frustration, fear, excitement, homesickness, etc.

Central Angiospastic Retinopathy: This is the term applied to a type of macular retinal lesion which is generally considered to be circulatory in origin. Visual disturbance is usually sudden in onset and may be quite severe, with central vision reduced to 20/200 or less. The condition is frequently bilateral. Visual fields show a small central scotoma. There is frequently a complaint of metamorphopsia. In the acute stage of the process a fundus examination shows a definite grayish edema of the macula with a loss of foveal reflex. As the edema subsides the macula takes on a mottled or granular appearance. The vision may improve markedly but seldom comes back to its normal acuity. A large number of cases show in the final stage a minute, sharply outlined, irregular hole in the fovea, with a corresponding prominent, minute, central scotoma and vision of 20/40 or 20/50. Practically all cases studied show definite clinical evidence of a vasoneurotic diathesis with signs and symptoms of associated deficient peripheral vascular circulation. Psychiatric studies have revealed anxiety states often of considerable severity.

Migraine: It is now generally accepted that migraine is a vasospastic disorder; that the preheadache scintillating scotoma and homanomus hemianopsia occur as the result of a severe cerebral vasospasm, and that the compensatory vasodilation produces the headache. Subjects with migraine show frequently certain typical personality features and reactions, and most migrainous patients show strong evidence of vasoneurotic diathesis.

Glaucoma: The importance of the psychic factor in glaucoma is recognized by every ophthalmologist. Many authors have cited instances of psychic precipitation of single attacks of acute glaucoma, and almost every ophthalmologist can duplicate these case histories from his own records. More and more evidence is being accumulated to show the close relationship between the intraocular vascular circulation, the secretion of the intraocular fluid, the level of intraocular pressure, and their control by the autonomic nervous system. Our present knowledge of the anatomic and physiologic connections with the autonomic

nervous system with the higher cerebral centers through the hypothalamus, makes it logical to assume a direct effect on intraocular pressure by these high centers. Certain it is that there are many aspects of glaucoma which cannot be explained by the purely mechanical theory of aqueous drainage. In many cases the personality deviation may be so severe as to suggest behavior bordering on the psychotic. Chronic emotional disturbances may play a definite part in the progress of a primary glaucoma without reference to congestive failure or crisis. This is not to say that glaucoma is a purely psychosomatic disorder, but only that psychic trauma may be a causal factor in many cases of glaucoma and its recognition will lead to a more rational and complete therapy of the disease.

Diagnostic Methods of Examination, Biomicroscopy and Photography

A Simple, More Accurate Means of Charting Visual Fields. *George Zugsmith, and Irving Rehman, San Pedro, Calif.* Am. J. Ophth. 32: 1573-6, Nov. 1949.

A short history of perimetry is presented, including references to the work of Ulmus, Von Graefe, Abertotti and Bjerrum. Mayer's work on a fluorescent test object is covered and his conclusions regarding advantages of a fluorescent object are given; it is critical and eliminates a moving target.

A small compact light, which may be controlled as to duration, interval and intensity is presented which can be used for the perimeter or tangent screen, using the same apparatus, thus dispensing with several sizes of test objects and several wands. Colored lights may be used for color fields.

The mechanism is inexpensive, yet more reliable than test objects. The patient finds the test easier and more definite than non-luminous test objects. 8 references. 1 figure.—*Author's abstract.*

Orthoptic Specification by a Graphical Method. *Henry W. Hofstetter, Los Angeles.* Am. J. Optometr. & Arch. Am. Acad. Optometr. 26: 439-44, Oct. 1949.

A graphic instead of the conventional method is suggested not only for recording the findings but also for prescribing various types of exercise for patients requiring orthoptic training.

In this method arrows are used as symbols for direct representation of the desired type and degree of each of a variety of training techniques. The use of arrows eliminates the necessity for detailed verbalization of instructions and specification of procedures. Interpretations

of the arrows are made in terms of their length, direction, and position on the accommodation-convergence graph generally used for analysis of these cases.

This method is applicable to most orthoptic instruments.—*Author's abstract.*

Conjunctival and Corneal Calcification in Hypercalcemia. Roentgenologic Findings. *Felix G. Fleischner and Seymour R. Shalek, Boston, Mass.* New England J. Med. 241: 863–5, Dec. 1, 1949.

Walsh and Howard have found, by ophthalmogic methods, calcifications of the eye in patients with hypercalcemia. A case of hypercalcemia is reported in the etiology of which, primary hyperparathyroidism, and immobilization secondary to severe rheumatoid arthritis or vitamin D poisoning possibly played a role. In this case the ocular calcifications, both in the cornea and conjunctiva could be visualized roentgenologically by the "bone-free" technic, which yields a tangential view of the anterior segment of the eyeball. 9 references. 3 figures.—*Author's abstract.*

A Low Power Infra-Red Microscope. *T. Stuart, Black Kelly, Manchester.* Brit. J. Ophth., Vol. 32: 396–7, July 1948.

A viewing device which consists of a low-power microscope incorporating an infra-red image converter tube replaces the normal binocular microscope on the slit-lamp table. The converter tube is a small glass tube containing an infra-red sensitive photo-surface and a fluorescent screen. An infra-red image focused on the former is transformed into a visible green image on the screen. The image converter tube is now available commercially.

This apparatus provides greater visibility not only through certain types of corneal opacities but it also permits penetration through roughened surfaces when aided by a contact lens. Visual penetration through a cataract depends more on the chemistry of the cataract than on its apparent density. A Koeppe glass may be of assistance in the examination of the vitreous or retina.

Subjective Retinoscopy. *Joseph I. Pascal,* Optometr. World 37: 48–50, June 1949.

Various applications of subjective tests based on the principles of velono-skiascopy are discussed.

The most important of these is the streak test for checking the amount of astigmatism. In this procedure a thin wire cross is held before the patient or placed in the trial frame after the eye has been slightly fogged. The patient is directed to observe a target which con-

sists of a white cross on a red background. The direction of the wires in the wire cross and of the white lines on the target are set to correspond to the previously determined cylinder axis. The patient then sees a red streak running through each white line of the cross. If the streaks are of equal width the astigmatism is considered fully corrected. If the streaks are of unequal width a minus cylinder is added with its axis along the wider streak to equalize the two streaks.

Ocular Movements and Motor Anomalies, Nystagmus, Reading Disability

The Handling of the Amblyopic Patient. *Maynard C. Wheeler, Vanderbilt Clinic, St. Vincent's Hospital, New York, N. Y.* Am. J. Ophth. 32: 1261–67, Sept. 1949.

The history is especially important in handling these patients. The earlier squint develops and the longer it has been present, the more time is required to restore vision. It is essential that parents understand which eye is turning in order to prevent possible misunderstanding in case of surgery. Peeking, memorizing and guessing must be carefuly eliminated when testing vision. Better comparison of the two eyes is obtained by using separate E's mounted on white plastic squares. Accurate tests of vision are unnecessary to determine the presence of amblyopia. Habitual use of one eye practically always indicates the other to be amblyopic.

Results of refraction vary in these cases, the amblyopic eye usually having the greater error. A thorough fundus examination, under anesthesia if necessary, must be made before occlusion. Diagnosis of the type of amblyopia is largely academic but some normal appearing eyes do not improve after adequate occlusion and are probably caused by some indistinguishable retinal or optic nerve lesion. These cases are called pathologic amblyopia and treatment abandoned if no improvement occurs after two months of complete occlusion. The determination of deviation may be difficult in patients who do not have reliable fixation in one eye. The cover test is useless but simple inspection quite helpful especially if apparently casual. Occlusion for one or two days may be necessary to demonstrate ability to fully abduct the eye. The angle of deviation must be estimated by Hirschberg's method of determining displacement of the corneal reflex in very young patients. The result is only approximate but the best obtainable in these cases. The prism reflex test is considered the most convenient and most accurate with children over 2 years old. The perimeter test is the best method for measuring deviation but is usually impractical for these patients.

The principles of the treatment of amblyopia are generally recognized. Early occlusion produces the quickest results. Time must be taken to carefully explain the procedure to the mother as her cooperation is essential. Occlusion is usually commenced with an adhesive bandage worn continually. Treatment is stopped if central fixation is not obtained in two weeks but continued if there is any visual improvement, until no further gain is shown after two to four weeks. There is no particular time when the bandage may be abandoned. Occlusion becomes increasingly difficult with older children and is not advised after the age of seven years. It should always be used before surgery if possible as waiting for surgery causes unnecessary delay. Operation is indicated as soon as the vision has become equalized or fixation switched unless orthoptic exercises are contemplated. The eyes should be made as straight as possible as soon as practicable in the hope that binocular single vision will be acquired. A cosmetic correction is all that can be expected if occlusion fails. These eyes tend to turn out later and should therefore be undercorrected at operation. The orthoptic technician can do valuable work in maintaining vision in the amblyopic eye after it is once obtained. Results of these methods of treatment showed satisfactory vision obtained in 64% of cases and maintained in 42% of these. 3 references. 1 table.

Head Tilt in Strabismus. *Joseph I. Pascal, New York, N. Y.* Am. J. Optometr. 26: 490–491, Nov. 1949.

In palsies of the vertical muscles there is often a compensatory head tilt for the purpose of fusing the images. The direction of the head tilt is easily remembered, as it is shown by the inclination of the corresponding limb in Pascal's Benzene-ring muscle schema. For purposes of suppression the head tilt is in the opposite direction. 1 figure. —*Author's abstract.*

Clinical Indications for Prescribing Prisms—With Three Case Reports. *Rudolph J. Textor, New York, N. Y.* Am. J. Optometr. and Arch. Am. Acad. Optometr. 26: 519–529, Dec. 1949.

The prescription of lateral prismatic corrections requires thorough analysis of numerous factors prior to a satisfactory correction. A discussion of the necessary considerations includes evaluations of previous corrections, age, health, symptoms, monocular occlusion, types of heterophoria and fusional amplitudes.

The two main types of heterophoria are described as anatomical and innervational. The former type will: 1) manifest consistent readings throughout successive examinations; 2) not be appreciably affected by a change of gaze; 3) show a physiological exophoria rather than a physi-

ological esophoria. This anatomical type of heterophoria is suggested as being most amenable to successful correction.

It is asserted that, rather than determining the strength of the extraocular muscles, the fusional amplitudes determine the ability of the fusion reflex to cope with a given situation. Normal values for the fusional amplitudes are presented and Sheard's formula for the amount of prism to prescribe is suggested as guide. Three case histories are included.—*Author's abstract.*

A Statistical Analysis of the Accommodative Convergence Gradient. *Arthur B. Emmes, Castro Valley, Calif.* Am. J. Optometr. 26: 474–82, Nov. 1949.

The findings from a systematic random sampling of the accommodative-convergence gradient for 100 out of 700 cases taken from the records of the Eye Refraction Clinic, United States Naval Training Station, Newport, Rhode Island during the war were subjected to standard statistical analysis.

The gradient represents the difference in the amount of the fusional supplementary convergence or near phoria, taken under disassociation at 16 inches with the near correction in place, and that found after + 1.00 D. sphere has been added.

Details of the statistical analysis were shown including the implementation of standard formulae for the mean, median, standard deviation and proofs. The results revealed the following: a mean of — 3.12 Δ, a median of — 3.01 Δ and a standard deviation of 1.64 Δ. Taking the median score as representative, the gradient findings were somewhat lower than the value of — 4.00 Δ found by Morgan and the value of — 6.00 Δ which has been so generally assumed in the literature. The standard deviation was somewhat higher than that reported by Morgan. 7 references. 4 figures. 3 tables.—*Author's abstract.*

Cornea, Sclera and Tenon's Capsule

Lamellar Graft of the Cornea for Mooren's Ulcer. (*La Greffe Lamellaire de la Cornée dans l'ulcère de Mooren.*) C. Monfette. L'Union Med. Canad. 78: 1322–3, Nov. 1949.

A Mooren's type ulcer had continually progressed, for four months, in the right cornea of a 42 year old man. Many forms of treatment had been of no avail. A lamellar graft, placed on the cleaned site of the active ulcer, stopped the processes although it did not clear the cornea.

Corneal Surgery. *R. Townley Paton, New York, N. Y.* Presented at the American Academy of Ophthalmology and Otolaryngology, 1949.

Penetrating Transplant:

A. Complete from limbus to limbus (up to the present not permanently successful).

B. Incomplete—4.5, 5.00, 7.00 mm., etc. in width.

Indications: 1) Conical Cornea—when contact glasses are not tolerated, or do not give sufficient improvement in vision. 2) Dense Central Scars—involving all the layers of the cornea with some clear surrounding cornea, mostly free of blood vessels. 3) Dystrophy—Groenouw's but not Fuchs' as a rule. 4) Following a preliminary lamellar transplant. 5) Adherent Leucoma—scar and iris removed at the same time. 6) Descemetocele—ideal treatment in place of conjunctival flaps. 7) Graft performed on one eye to ascertain possibility of improving vision in the better eye later on. 8) Cosmetic improvement.

Donor Material:

1) Fresh enucleated eyes within 6 hours after death, sometimes longer if lids are kept closed. Age—from birth to 80 and over. Arcus senilis a contraindication, if very advanced and extending to central area. 2) Part of cornea used must be clear, although a slight bedewing of the epithelium does no harm. 3) Serological syphilis tests must be negative. 4) Eyes with tumors in anterior segment should not be used. 5) Eyes that have had a keratitis or anterior uveitis should not be used. 6) Absolute glaucoma, blood staining of cornea and gliomas may be a contraindication for using an otherwise healthy eye. 7) Eyes of still born are not the best donor material as the tissues are delicate and the cornea is too malleable.

Technique:

1) Prepare patient as for cataract operation, excepting that pupil is contracted with pilocarpine. Superior rectus suture and retrobulbar injection usually unnecessary. 2) Lid sutures and Katzin metal mask in place of speculum. 3) Cut complete window from donor eye with trephine. Scissors not necessary. Place window on fenestrated spatula with endothelial surface upward exposed to air. Avoid putting graft in Ringer's solution as formerly advised, to avoid edema. 4) Outline graft on patient after setting guard for proper depth. 5) Drop 2% Sodium Fluorescine on outlined circle and wash out with Ringer's solution. 6) Place two double armed sutures, one white and one black 6-0 with a traumatic needle in figure of eight fashion. In taking bites stay within 1 mm. of outlined window. Each bite should be of same length. 7) Place central suture excepting in conical cornea etc. when cornea is too thin. 8) Complete cutting with trephine penetrating into

anterior chamber. 9) Complete cutting with curved Katzin corneal scissors. 10) Remove button. 11) Drop Pilocarpine or Eserine on exposed iris. 12) Place graft in position and tie sutures. Anterior chamber should begin to reform immediately. 13) Usual cataract dressing (do not use any ointment in eye, however).

Post Operative Care:

First dressing in 48 hours. Patients may turn on unoperated side during first 24 hours. May be up out of bed on fourth day. Unoperated eye uncovered on fourth day. Atropine* and Metaphen 1:2500 aq. sol. instilled at each dressing. Sutures removed from 7 to 14 days.

Lamellar Transplant partial thickness of cornea:

A. Complete from limbus to limbus, using trephine method.

B. Partial—4, 5, 6, 7, 8, mm., using trephine method.

Indications: 1) Optical where scarring is superficial and where scarification and treatment with dil. 2% HCl has brought about no improvement. 2) Preparatory for a penetrating corneal transplant. Densely scarred corneas with or without large or small blood vessels. Beta radiation may or may not have been previously performed. 3) Therapeutic: a) Partial, b) complete, and c) annular, with desired sized sector cut out. For herpetic ulcer (late stages) superficial punctate keratitis (late stages), recurrent erosion of the cornea where scars have developed, or associated with other complications. Recalcitrant ulcers. Bullous keratitis (not all types). Mooren's ulcer (must be done very early), vision may be 20/15 (if first eye has been lost). Chemical burns—emergency (if corneal tissue is available). In place of delineating keratotomy.

Technique for Cutting Annular Grafts:

Annular lamellar grafts for the treatment of marginal scars and ulcers are cut by using two trephines of different size. The guard on the trephines are set to cut only to a depth of $\frac{1}{2}$ mm. A complete annular graft is rarely ever indicated. Usually $\frac{1}{4}$ to $\frac{1}{2}$ of the annular graft is all that is needed. Calipers are used in order to obtain the exact size needed. A traction suture is usually placed through one edge of the graft to aid in the dissection. A Bard-Parker No. 15 knife is helpful in making the dissection. For central lamellar grafts a similar technique is employed. The grafts are held in place by either direct or overlying sutures. This technique is a slightly modified method advocated by Paufique and Sourdille.—*Author's abstract.*

* Atropine was formerly employed but it has been found that adhesions from the greater circle of the iris are of less consequence as they are easier to break than those that might arise from the lesser circle. Adhesions if they occur as a post-operative complication result during the first four or five days. After this time atropine may be used.

Retina

On the Diagnostic Significance of Retinal Arterial Systolic Pressure. Endarteritis obliterans of the Central Retinal Artery. (*Sull' importanza diagnostica della pressione arteriosa retinica sistolica. L'endoarterite obliterante dell'arteria centrale della retina.*) *Laetitia Nigro, Bologna.* Rivista oto-neuro-oftal. 24: 409–21, Sept.–Oct., 1949.

The significance of systolic retinal arterial pressure in the diagnosis of primary thrombosis of the internal carotid artery is stressed, as well as for the study of Buerger's disease of the retina and circulatory disturbances of the extremities. A unilateral decrease of retinal arterial pressure in the presence of occlusion of the central retinal artery is a symptom of endarteritis obliterans. Buerger's primary thromboangiitis of the retinal artery is to be suspected only under the following conditions: a) a young patient, b) the clinical picture of occlusion of the central retinal artery, c) a decrease in systolic retinal arterial pressure in the involved eye as compared with that of the normal eye, d) the absence of any circulatory defect of the internal carotid such as thrombosis, ligature, arteriovenous aneurysm, neoplastic compression and the absence of any other known etiology.

Obstruction of circulation in the subclavian artery (aneurysm, endoarteriitis, etc.) will cause a constant decrease in systolic pressure in the humeral artery. If the retinal arterial pressure on the same side is normal (as compared with that of the femoral and retinal artery of the opposite side) one may conclude that the homolateral carotid artery is not involved. The same conditions found on the right side will indicate that neither the carotid nor the innominate artery is involved. These same rules apply to circulatory obstructions of the abdominal aorta, the iliac and femoral arteries. Tabular data are included concerning 7 cases of occlusion of the central retinal artery and 3 cases of occlusion of the subclavian artery. 1 table.

The Technic of Surgical Closure of Retinal Holes at the Posterior Pole. (*Zur Technik des operativen Verschlusses der Netzhautlöcher am hinteren Augenpol.*) *Gustav Guist, Vienna.* Klin. Monatsbl. f. Augenhl. 115: 232–40, Heft 33, 1949.

Besides having a relatively poor prognosis, operative closure of macular retinal holes is a very difficult intervention. Access to the posterior pole is obtained by exposing the temporal orbital margin according to Krönlein and making an opening with a 12-mm. crown trephine. This is followed by a curved conjunctival incision in the region of the insertion of the external rectus which is retracted and pulled back

through the trephine opening. By manual adduction of the eyeball, the triangle between the optic nerve and insertion of the two oblique recti becomes accessible through the trephine opening. It is very difficult to avoid injury to the ciliary arteries. Permanent obstruction of circulation in this area may lead to atrophy of a portion of the choroid. Destruction of the ciliary nerves may cause neuroparalytic keratitis. The macular holes can be closed by the caustic potash method. Following trephination of the sclera in the macular region with a 1–7-mm. trephine and exposure of the choroid, the lesion is cauterized with KOH and neutralized with 4% acetic acid. Immediate opthalmoscopic examination will show whether the proper site has been chosen. It will appear on the eyeground as a grayish yellow cloudy disk. If the site has been properly selected, one may proceed to perforate the choroid after which it remains only to close the wound. If the cauterization has not covered the retinal hole another attempt can be made. Various methods for closing the macular holes have been suggested but none are quite satisfactory.

The technic used by the author is described in detail. Following one of the usual methods of anesthesia employed for intraocular operations, the lid speculum is introduced and the conjunctiva is caught with a silk suture and drawn nasal-ward by an assistant throughout the operation, with the result that at the end of the operation, the conjunctival and scleral wounds are displaced in relation to each other, thus reducing the danger of infection. A Graefe knife is inserted in the region of the ora serrata, the position of which has been previously ascertained by diascleral transillumination. Holding the electric ophthalmoscope in one hand, the vascular aperature is located and with the other hand the knife is inserted and advanced under ophthalmoscopic control to the macular hole. Upon reaching the eyeground the point of the knife and its shadow come together exactly at the macular hole. Scarification is then applied to produce a sufficient hemorrhage. If the latter is not adequate, scarification can be continued with the knife which is still in position. The knife, silk suture and speculum are then removed and *both* eyes are bandaged. The patient is placed on his back. In cases of more extensive retinal detachment, a regular detachment operation can be performed first using caustic potash on the external portion of the bulb. If a second peripheral retinal detachment is present, the operation must be done in the corresponding half and the macular hole is then later scarified with the Graefe knife. The subretinal fluid is then permitted to escape by perforating the cauterized site of trephination. Three cases are described in detail. Not all macular holes are followed by retinal detachment but it is impossible to foretell the results. This simple operation can be repeated and is less complicated than other chemical and electric methods.

The technic of scarification of the choroid in the vicinity of the macular hole is described in detail. Once this hole is closed the subretinal fluid will soon disappear, if it is not too abundant and the detachment not too high. In cases with vesicular detachment combined with macular hole and an abundant subretinal fluid, a regular caustic potash detachment operation will be necessary, with perforation of the cauterized area and scarification of the adjoining choroid. Tabular data are presented for the 18 patients in this series, including 13 cases of traumatic foveal defect with subsequent flat detachment, 3 cases of traumatic foveal detachment with high vesicular total detachment and 3 cases of extrafoveal defects with total spontaneous detachment.

For a number of reasons it would seem more logical to use a needle knife instead of a Graefe knife for making scarifications under ophthalmoscopic observations.—Editor.

Diabetes Mellitus Complicated by Hypercholesterolemia, Lipemia Retinalis, and Hepatomegaly; A Case Report. *Fred H. Mowrey (Col., M.C., U. S. A.) and Sidney G. White (Capt., M.C., U. S. A.)* Mil. Surgeon. 105: 228-34, Sept. 1949.

A case of this rare disease is reported in a 29-year-old man admitted to hospital in diabetic acidosis with coma. His diabetes had been discovered a little over two years previously. He had been doing well on diet and 30 units of protamine zinc insulin but had been off both diet and insulin for two weeks before admission. Examination showed the liver palpable 6 cm. below the right ribs. Blood pressure was 110/70. Urinalysis showed 4 plus sugar and acetone, granular casts and occasional red blood cells. Blood sugar was 230 mg. per cent and blood cholesterol 1250 mg. per cent. Erythrocytes were 2,700,000. A sample of blood had a creamy appearance. The fundi presented a light salmon colored, waxy appearance. The blood vessels appeared dilated and were difficult to distinguish. Optic discs and vision were normal. The diabetes was difficult to control because of varying sensitivity to insulin but the acidosis was controlled by the administration of insulin, glucose, $\frac{1}{6}$ molar sodium lactate and normal saline. He received choline 4 Gm. and ferrous sulfate 1.2 Gm. daily in addition to insulin. The lipemia retinalis disappeared in eleven days and the central fundus returned to normal though the blood cholesterol continued at 825 mg. per cent. The patient gradually returned to normal, the liver not being palpable a month after admission, and blood cholesterol falling to 170. His diabetes was well controlled in a 1960 calorie diet plus 40 units of protamine zinc insulin daily. Liver and renal functions were normal.

Lipemia is characterized by an increased amount of neutral fat in the serum, the fat becoming so emulsified that it assumes a creamy appearance. It may be postprandial, after a fatty meal; retention lipemia,

caused by slow elimination of fat from the blood stream; or transportation lipemia following an increased rate of transfer from the depots to tissues. Lipemia in diabetic acidosis is supposed to result from mobilization of tissue lipids to meet requirements of ketone body production, or a hemo-concentration caused by a combined glycosuria and acidosis.

Lipemia retinalis is a rare disease which, for some unknown reason, does not occur in all cases of lipemia. Review of the literature shows only 76 cases previously reported. It usually occurs in young male adults with diabetic acidosis. Only 6 cases have been reported in non-diabetics. The changes in the fundus usually disappear promptly with control of the diabetic acidosis. 63 references. 2 tables. 1 figure.

Failures in Retinal Detachment Surgery. *Ivan J. Kornia, University of Buffalo School of Medicine, Buffalo, N. Y.* New York State J. Med. 49: 2405–8, Oct. 15, 1949.

Clinical and pathologic conditions contributing to failure in unsuccessful treatment of retinal detachment are discussed. Age itself apparently has little influence but patients over 60 years of age have a poorer prognosis. Prognosis is better in small detachments and cases receiving early surgery. The vitreous acts as a foreign body and any detachment for over two years will produce complete loss of choroidal function. Myopia is a contributory factor in detachment and apparently gives an unfavorable prognosis. Low grade uveitis or hyalitis may cause adhesions between the retina and vitreous. Any subsequent forward displacement or shrinkage of the vitreous will then produce detachment and may cause failure. Considerable damage may follow the production of new retinal holes by touching the retina with the point of the diathermy needle in vitreous disorganization following penetration of long needles into this substance. Traction bands may occur in the vitreous and cause reseparation of the retina.

Uveal tract involvement has an important influence upon the prognosis of retinal detachment. Failure followed appearance of a positive aqueous beam in 11 of 12 cases. The prognosis is not good if an old dormant anterior retinochoroiditis is found preoperatively as it may be reactivated by electric coagulation. Dense vitreous opacities following excessive uveal reactions are etiologic factors in vitreous disorganization. Control of the posterior uveitis following diathermy is an important part of the postoperative treatment of retinal separation. Injury to the ciliary body may be readily prevented by keeping coagulation behind the anterior insertions of the rectus muscles. This line is located on the sclera by placing a series of punctate superficial coagulations about 8 mm. behind the limbus in the quadrant where work is being done before the tear is attacked. Spread of uveitis to the anterior seg-

ment may be controlled by using cycloplegics for several months after surgery. Intraocular hemorrhage cannot always be avoided and may cause retinal detachment. The long posterior ciliary arteries and vena vorticosa should be constantly remembered, a coagulating current or ligature applied to the former producing anterior choroiditis and cataract. The occurrence of preoperative hyperphorias and tropias following tenotomy for better scleral exposure may be prevented by use of a bridal suture under 2 or more muscles instead. Repeated examinations tend to increase the incidence of tears and consequent poorer prognosis. Failure may also follow the injudicious use of long pins, other localizing devices, or inadequate sealing of the tear. Long pins and deep penetration are unnecessary if the variations in scleral thickening are remembered. The amount of drainage required varies with the type of detachment. Inadequate drainage may cause failure and may be prevented by making the drainage holes with the current on as the needle is withdrawn. Injection of air or saline into the vitreous or anterior chamber assists replacement of the retina, increases subretinal drainage, and decreases failures. 11 references.

The Present State of the Problem of Retinitis Pigmentosa. *I. Biró, Budapest.* Brit. J. Ophth. 32: 411–15, July 1948.

It is emphasized that retinitis pigmentosa is not a uniform disease in either course or origin. The disease should be divided into hereditary and autonomous types. The hereditary type is primarily a neurocellular disease of the brain and retinal elements and appears as a recessive or dominant inheritance. The majority are recessive.

The autonomous type is not inherited nor systematically connected with the central nervous system.

The treatment of inherited forms is hopeless but some form of therapy may prove useful in the autonomous type. 38 references.

Macular Lesions. *Everett H. Wood, Auburn, N. Y.* Presented at the American Academy of Ophthalmology and Otolaryngology, 1949.

A review of the anatomy and physiology of the macula was given, pointing out particularly that the macula is a very highly developed portion of the retina and one of the newest developments from a phylogenic aspect. Likewise, the macula is particularly susceptible to disease and in most instances diseases of the macula result in permanent loss of function. The susceptibility is attributed to decreased circulation and the loose tissue of the layer of Henle surrounding the macula.

An attempt was made to discuss some conditions of the macula that can be successfully treated therapeutically, resulting in good function. The first condition to be discussed was central serous retinopathy, which

is an edema of the macula, occurring in young adult males. It appears as an annular swelling, producing a darkish red coloring around the macula approximately the size of the disk. The principle symptom is moderate loss of vision and sometimes increased Hyperopia. Treatment consists of elimination of any toxic factors and the use of vasodilators. It is usually well to check the general circulatory balance of the individual affected.

The second condition was anemia in the macula. This results from two causes, local and general. The general cause, of course, is from simple exsanguination. Macular disease from this results more frequently from general conditions such as hematemesis, melena, hemoptosis, etc. rather than from bleeding wounds. Frequent small hemorrhages are more destructive than one massive hemorrhage. Treatment consists of stopping the bleeding, treating the general condition and locally hot compresses, subconjunctival irritative drops or possibly subconjunctival injections. It may be necessary to reduce the intraocular pressure by paracentesis. This means may be used in extreme cases. The local cause of anemia is of course closure of the central artery of the retina. This may be due to spasm or blockage by clot. When spasm is the cause, recovery may result. The aids to this recovery are vasodilation, stabilization of the neurovascular system of the individual and possibly some of the heroic methods mentioned above. Toxic factors such as influenza, malaria, menstrual or ovarian disturbances, toxemias of pregnancy may predispose to spastic closure.

The third subject was glaucoma. The macula is affected in glaucoma and there develops in a case, which is progressing, a wedge-shaped scotoma with its apex pointing toward the macula. The presence of this scotoma was described by Dr. John Evans in 1944, and when present, it is a very helpful indication as to the progress of the cases, and aids in deciding whether or not a particular case should be subjected to surgery.

There was a short discussion of the all too familiar picture of hypertensive and nephritic neuroretinopathy with reports of two cases of complete subsidence of the retinopathy after a regime on the rice diet introduced by Dr. Kempner of Duke University.

Finally, a challenge was issued in connection with the discussion of retinopathy of diabetes. It is obvious that some factor other than hyperglycemia is responsible for the retinopathy since many cases go for many years without sugar using the insulin treatment and still develop a retinopathy. What is this other factor? If we can determine this, it may be possible for us to prevent, in the future, development of retinopathy, which to this point has been irreversible in the diabetic patients.—*Author's abstract.*

Fundus Changes in Arterial Hypertension. *Herman Elwyn, New York, N. Y.* Presented at the American Academy of Ophthalmology and Otolaryngology, 1948.

There are three processes in the retinal arteries which concern us here: (1) aging, (2) arteriosclerosis, (3) contraction of arteries.

1. The aging process in arteries everywhere is characterized by a diffuse thickening of the intima and by a diminution in the elasticity of the vessel wall. The artery is lengthened and widened. In the retinal vessels aging shows itself in a tortuosity of the vessel and in a widening of the light reflex.

2. Arteriosclerosis is a localized nodular thickening of the arterial wall, added to the aging process. Lipoids are deposited in the intima and coalesce to form aggregates. Where they occur the tissue becomes hyalinized, and between the lipoid focus and the lumen the intima is locally thickened. The lipoid focus becomes softened (atherosis) and calcium is deposited there. An arteriosclerotic plaque thus consists of a localized focus of lipoidosis, hyalinosis, calcinosis and atherosis, with a reparative connective tissue thickening between the focus and the lumen. With some variations the constituent elements of the arteriosclerotic process are everywhere the same. This also holds true for the retinal arteries. Here the arteriosclerotic foci are seen as localized irregularities in the course of the artery.

Aging and arteriosclerosis of the retinal vessels are sometimes seen in elderly people. They are more frequently seen in cases of benign essential hypertension. The importance of noting the tortuosity and the irregularities of retinal vessels is that they indicate the possible presence of hypertension.

Arteriosclerosis is of importance in that it constitutes a cause of obstruction of the central artery or of its branches when the arteriosclerotic plaque completely occludes the lumen of the vessel. Similarly, a local thickening of the vessel wall may competely occlude the central vein or one of its branches.

3. Contraction of the arteries occurs:

a) As a localized contraction of segments of arteries. This frequently is the case in young individuals without hypertension, but occurs also in cases of hypertension. Such a localized contraction may not lead to any retinal changes; or it may be accompanied by a dilatation of the corresponding capillaries with the occurrence of a few hemorrhages and of a few cotton-wool patches.

b) As a contraction of all the retinal arteries. This is characteristic of certain cases of hypertension, and it is necessary to understand the consequences of such a general contraction. One of these is a visible narrowing of the arteries. With the contraction of the arteries there occurs a dilatation of the terminal capillaries and precapillary arterioles.

The circulation in them is slowed with a resulting hyperemia, and at various periods plasma transudes through the walls of the dilated capillaries and red blood corpuscles pass through them. As a result of the hyperemia there is seen in a typical case in addition to the narrowed arteries, a redness of the disk with the appearance here of fine vessels, and a blurring of the disk margins. As a result of the transudation of plasma and of red blood corpuscles there are seen edema of the retina cotton-wool patches and hemorrhages.

Narrowed arteries, hyperemia of the disk, edema of the retina, cotton-wool patches, and hemorrhages are the consequences of a general contraction of the retinal arteries. We may speak of the arterial contraction as arteriospastic contraction, and of the retinal changes as arteriospastic retinitis or retinopathy. The individual elements vary with the severity and with the duration of the arterial contraction.

When the arterial contraction persists the defective nutrition of the retinal tissue results in deposits there of hyaline and of lipoids. Around the fovea the deposits appear as a star figure.

Classification of Hypertension

Persistent arterial hypertension occurs as:

1. Essential hypertension or benign essential hypertension.
2. Malignant hypertension or the malignant phase of essential hypertension.
3. An intermediary group of cases of essential hypertension.
4. Hypertension of renal origin, such as diffuse glomerulonephritis.

The normal blood pressure of an adult ranges from 110 to 140 mm. of mercury systolic and from 60 to 90 mm. diastolic. An increase above 150 mm. systolic and 100 mm. diastolic is abnormal. The normal blood pressure is maintained by an effector organ which consists of the muscular coats in the walls of the small arteries in the splanchnic region. The tonus and degree of contraction of the muscular coats in the walls of these arteries are so regulated as to maintain the normal blood pressure.

Benign essential hypertension is a condition in which the organism has lost its ability to regulate properly the tonus and degree of contraction of the effector organ in the splanchnic vessels. This makes itself felt in middle life and the maintenance of the blood pressure gradually becomes unstable. There are greater variations of the blood pressure, and with the passing of years the pressure finally reaches 200 mm. and more. The tempo is variable; it may take a few years only or as much as twenty years. It is important to bear in mind that the small arteries in the splanchnic region only undergo a change in tonus and contraction. There is no general contraction of the arteries in other regions such as the kidneys, the skin, the brain, and the eyes. It is also important to recognize that in benign essential hypertension there is no

renal insufficiency and kidney function is perfectly normal. In the later years changes appear in the arteries; namely, aging and arteriosclerosis.

In the fundus of the eye there are no changes either in the retina or its vessels during the many early years of benign essential hypertension. With the passing of years signs of aging and arteriosclerosis appear in the retinal vessels. The typical fundus lesions in benign essential hypertension are: (1) tortuosity of the retinal vessels; (2) widening of the light reflex; (3) irregularities in the lumen of the vessel. In addition there occurs occasionally a localized contraction of a small vessel, frequently not visible but resulting in (4) a few localized hemorrhages or an occasional exudate. An added complication is the occlusion of a large retinal artery or vein.

Of very great importance are certain negative features: (1) There is no general contraction of all the retinal arteries; and (2) there are no retinal changes due to such a general contraction; that is, there is no arteriospastic retinitis.

Malignant hypertension: In some cases of essential hypertension the progress of the hypertension is more rapid. The changes in the arteries are accelerated and are more severe. To the functional change in the small arteries of the effector organ in the splanchnic region there is added a general contraction of many small arteries in other regions, such as the kidneys, the skin, the brain, and the eyes. This arterial contraction is severe and changes the benign hypertension into a malignant one. There are cerebral symptoms and there is permanent renal insufficiency. The presence of renal insufficiency is a paramount importance. In the fundus of the eye there are seen narrow retinal arteries and the whole picture of arteriospastic retinitis which I have previously described. Death usually occurs within a year.

The intermediary group of cases of hypertension: Between the benign essential hypertension which may last twenty or thirty years and the malignant hypertension which causes death within a year, there are cases of hypertension which form an intermediary group. After many years of hypertension of the benign type there occurs a general contraction of the retinal arteries with a resulting arteriospastic retinitis. The degree of contraction is variable and the individual elements of the arteriospastic retinis, the edema, the cotton-wool patches, the hemorrhages, and the hyalin and lipoid deposits vary a good deal and are not as severe as in the malignant cases.

The differentiation between the cases of this group and the malignant cases is important. In the cases of this group there is no renal insufficiency at all or this is very slight and is relative only, while in malignant hypertension there is always absolute renal insufficiency, and the nonprotein nitrogen in the blood is increased. The cases in this intermediary group may last for many years. They succumb either to an inter-

current affection, or to cerebral or coronary arterial disease; or there is a sudden development of renal insufficiency and the case becomes malignant.

Renal hypertension: This is exemplified in diffuse glomerulonephritis but occurs also in other forms of renal disease. Here the hypertension is not the result of the inability on the part of the organism to regulate the normal tonus and contraction of the effector organ for the maintenance of the normal arterial pressure. In the kidney the intraglomerular filtration pressure must be maintained at a certain level. Any danger to the intraglomerular filtration pressure is at once followed by an increase in the general arterial pressure to maintain the normal intraglomerular filtration pressure. There is, therefore, a change in the tonus and contraction of the effector organ in the small arteries of the splanchnic region. But there is also a variable general contraction of the small arteries in many organs including the skin, the brain, and the eyes. The contraction of the small arteries in the brain is responsible for the cerebral symptoms. In the eyes all the retinal arteries are contracted to a variable and varying degree. Depending upon the varying contraction of the retinal arteries are the individual elements of the arteriospastic retinitis: the narrowed arteries, the hyperemia of the disk, the cotton-wool patches, the hemorrhages, the hyalin and lipoid deposits and the star figure in the macula.—*Author's abstract.*

End Results in Retinal Detachment. *Charles A. Perera, New York, N. Y.* Presented at the American Academy of Ophthalmology and Otolaryngology, 1948.

Classification according to etiology: Following chorioretinitis, contracture, cysts, degeneration, dialysis, hemorrhage, hole, myopic degeneration, nephritis, staphyloma of sclera, trauma, idiopathic.

Anatomic considerations: Weak adherence of retina to choroid, especially at macula. Vitreous lightly adherent to retina, less so in old age. Retina is pulled forward in accommodation (atropinization advisable in retinal detachment).

Production and evolution of detached retina: Begins with retinal tear (with or without hemorrhage) in vast majority, except in exudative choroiditis, scleritis, nephritic retinopathy, orbital cellulitis. Once retina is elevated, 3 factors act to increase detachment.

1. Movement of eyes; this destroys structure of vitreous and makes it more fluid.

2. Senile or pathologic retraction of the vitreous.

3. Retraction and contracture of the retina by sclerosis and degeneration.

In some cases of exudative choroiditis, the retina is elevated and tears at a site of adhesion to the choroid.

Evolution of the detachment is usually progressive. Inferior detachments progress more slowly and tend to extend less widely. Inferior disinsertions are seen most after trauma, and in young patients, when they are sometimes bilateral. Retinal degeneration follows detachment; late complications are cataract, uveitis, and glaucoma.

Etiologic factors:

1. Myopia in 40 to 65 per cent of phakic cases. Myopic degeneration.

2. Chorioretinal changes (inflammatory indolent, myopic, senile) at equator and periphery precede retinal perforations and subsequent detachment. Acute chorioretinitis is less likely to lead to detachment because of resulting firm scar.

3. Age. Incidence of detachment increases over 40 when senile changes begin. Sixty-five per cent of phakic detachments and 75 per cent of aphakic detachments occur over age of 40.

4. Vitreous changes (opacities, detachment, adhesions to retina) in many cases. Loss of vitreous increases incidence of detachment after cataract operations. About one-half of detachments after cataract extractions have their onset over six months after operation, one-third over two years after operation.

5. Blow on head or eyes.

6. Congestion from stooping and lifting in a predisposed eye.

Examination of the patient:

1. Transillumination and fields. Vision. Tension.

2. Study after rest in bed, with eyes bandaged; also important in cases of vitreous hemorrhage.

3. Use of direct and indirect ophthalmoscopy with bright source of light.

4. Patient search for holes (single or multiple). Holes may be overlooked when hidden behind fold of retina, when hole is above and detachment is below, and in small peripheral disinsertions. Removal of subretinal fluid may rarely be necessary to expose hole. Type of holes: horseshoe or arrowhead (mostly upper temporal, then upper nasal); round holes (mostly upper temporal, then lower temporal); irregular slits and tears; macular holes (vs. macular cyst). History valuable in finding original tear. Examiner may be guided to hole by finding operculum. Differentiation of tears from hemorrhages.

5. Prognosis poor if cataract, corneal scars, or turbid vitreous blocks study of fundus. Sketch of fundus and site of tears.

6. Localization of the tear. By use of perimeter preoperatively.

Perimetric localization of retinal tear:

Angle of observation	Distance from limbus in millimeters	Angle of observation	Distance from limbus in millimeters
80	8.4–10.2	40	17.6–20.4
70	10.2–12.4	30	20.4–23.3
60	12.4–14.9	20	23.3–26.2
50	14.9–17.6	10	26.2–29.2

Distance from limbus is farther nasally than temporally, and between these figures in vertical plane.

Multiply figure by 1.16 in myopic of 10 diopters. Multiply figure by 1.25 in myopic of 15 diopters. Multiply figure by 1.33 in myopic of 20 diopters.

Contraindications for operation:

1. Poor general health.
2. Local causes: absence of tears, exudative chorioretinitis, very low tension.
3. Old detachments which involve more than inferior portion.
4. Severe trauma.

Technic of operation: 1) Linder Guist. Electrolysis. Diathermy. Scleral resection. 2) Handling of muscles. Rarely necessary to detach muscles except when treating macula. 3) Localization of hole by projection of light, by pressing on sclera and marking when region of hole moves, by transilluminator, by touching supposed area with electrode and looking at fundus, by orienting lancet or localizing diathermy pin. 4) Intensity of diathermic current (60 to 100 milliamperes). Sclera must be dry. Do not overtreat. 5) Ideal cases are those with small holes. 6) Drainage of subretinal fluid. Suction. 7) Injection of air or saline into vitreous or into anterior chamber in some cases. 8) Ophthalmoscopic observation during operation. 9) Complications during operation. Pain, hemorrhage, corneal opacity, hypotony. 10) Handling of large disinsertions and macular holes. Multiple tears. 11) Treatment when no hole can be found. 12) Holes without detachment.

Postoperative complications: Vomiting. Restless patient. Local reaction. Vitreous hemorrhage. Hypotony. Choroidal detachment. Metamorphopsia; Diplopia. Reduction in myopia.

Postoperative care: Binocular dressing. Position in bed depends on site of detachment; absolute immobility not advisable; sedatives. Quiet; length of time in bed (over nine days); first dressing three to seven days after operation, other dressings every two or three days; Fundus study two weeks after operation. Not favorable if detachment is present twelve to fifteen days after operation. Central aperture goggles. Allow to resume activities in favorable cases after one to three months.

Cases of reoperation: Cases with retina detached aften ten to fifteen days usually do not become cured, but some become reattached by continuing bed-rest. If holes are seen, another operation will probably be needed; the holes may be the original or new ones. If the holes are

old ones the failure to attach may be due to choroidal exudation. When the holes persist, but are walled off by a barrier of chorioretinitis, the prognosis is more favorable.

Scar tissue at site of reoperation induces difficulties of dissection. Thinness of sclera.

Indications for reoperation: 1) Exact localization of tears; 2) Absence of local reaction; 3) Transparency of media enough to permit observation during operation; 4) Satisfactory general condition.

In aphakics, only one operation after failure is worth attempting. In phakics, reoperation is worth while.

Prognosis as affected by preoperative clinical findings (Arruga, Dunnington, Bagley, author's statistics): 1) Age. Reattachment attained in 60 to 70 per cent of cases before 60, in only 35 per cent of cases after 60, 2) Refraction. Percentage of reattachments is reduced in myopia over 4D, 3) Aphakia. Prognosis is reduced by presence of vitreous opacities, and by loss of vitreous at time of cataract operation. Aphakia reduces percentage of reattachments, 4) Active uveitis with positive aqueous ray reduces percentage of cures, 5) Duration of detachment. Delay in operation reduces prognosis because of degenerative changes in retina and increase in extent of involved area of detachment. Proportion of successes diminishes with greater area of detachment, 6) Retinal holes. Prognosis best (over 90 per cent) in cases with small peripheral hole and recent small detachment. Prognosis diminishes with increase in size of hole, and with multiplicity of holes. When detached retina is bullous or considerably elevated, prognosis is reduced if retina does not reapply after rest in bed. Small disinsertions offer favorable results. Large disinsertions (more than one-fourth of retinal periphery) reduce cures to 30 per cent, and very large disinsertions (two fifths to one-half of retinal periphery) to 10 per cent. Macular holes reduce reattachments to about 50 per cent. Percentage of successful results is much reduced if a retinal hole cannot be found, 7) Turbidity of media (corneal scars, lens opacity, cloudy vitreous) affect prognosis adversely, 8) Hypotony markedly reduces prognosis.

Prognosis as affected by operative findings:

1) Technics using perforating diathermy appear to offer best results. (Pins, multiple punctures, or combination of both); 2) amount of subretinal fluid evacuated at operation has no influence upon prognosis; 3) escape of subretinal fluid before or after diathermic application does not alter prognosis; 4) in large detachments, prognosis is best if area around hole alone is coagulated, and results are much less satisfactory if more than two quadrants are treated; 5) prognosis more favorable if retina at end of operation is flat or only slightly elevated. Injection of saline into the vitreous in phakic eyes and into the anterior chamber in aphakics when retina is much elevated at close of operation improves prognosis (Grafton and Guyton).—*Author's abstract.*

Neuro-Ophthalmology, Optic Nerve, Visual Pathways, Centers and Visual Fields

Optochiasmatic Arachnoiditis. Report of a Case. *Morgan B. Raiford, Atlanta, Ga.* Virginia M. Monthly, 76: 586–88, Nov. 1949.

A case is reported of optochiasmatic arachnoiditis showing progressive bilateral contraction of the visual fields and loss of visual acuity. Changes in the fundi and pallor of the disks was greater in the right eye. On the basis of the case history and the examination, a diagnosis was made of adhesive bands anterior to the chiasma. This was confirmed when the bands were liberated at surgery. When the patient was last seen he showed remarkable improvement of both visual fields and visual acuity improvement in both eyes. He had been enabled to attain a high scholastic standing in his high school work.

This 8-year-old patient is the youngest on record to have been treated for this condition. 13 references. 2 figures.—*Author's abstract.*

Visual Manifestations of Head Injuries. *Joseph C. Hill, Toronto, Ont.* Canad. M. A. J. 60: 464–68, May 1949.

Most of the ocular abnormalities which are found after head injury fall into three groups: 1) injuries of the globe itself; 2) derangement of ocular motility and 3) lesions of the visual pathways. This paper deals only with the lesions of the visual pathways that occurred in certain Canadian veterans of World War II.

Traumatic involvement of the visual pathways exclusive of the eyeball is almost wholly confined to two areas, 1) the optic nerve, and 2) the geniculo-calcarine radiation and visual cortex. The optic nerve is more often involved in traumatic head injuries than any of the oculomotor group.

Lesions of the Optic Nerve: The commonest type of injury which results in partial or complete optic atrophy is a closed head injury without radiological evidence of fracture of the optic foramen. In those cases in which partial recovery occurs, improvement in vision starts in three or four days. At the end of three or four weeks there is no further improvement.

In cases resulting in partial optic atrophy, the visual field defects fall into two main groups: 1) those in which a scotoma is the main feature; 2) those in which a peripheral sector defect is found.

In severe injuries of the optic nerve, inequality of the pupils does not occur unless there is an associated third cranial nerve lesion or traumatic mydriasis. Ophthalmoscopically, pallor of the optic disc usually becomes apparent towards the end of the third week.

The most probable explanation of the pathogenesis of indirect injury of the optic nerve is that a hemorrhage or thrombosis occurs at the time of injury with resultant softening in the substance of the nerve.

Twenty-five cases of traumatic optic atrophy were studied. Nine of these had an associated penetrating wound of the skull with resultant damage to brain tissue by the missile itself or in driven bone fragments. The 16 remaining cases developed optic atrophy following indirect damage to the optic nerve from a closed head injury. Only 3 of these showed fissure fractures of the optic canals.

Lesions of the Optic Tract: Two cases of optic tract lesions were diagnosed on the basis of the route of the projectile. Their field defects were hemianopic with a tendency to incongruity. There was no apparent optic atrophy after three years.

Lesions of the Geniculo-Calcarine Radiation and Visual Cortex: Twenty-five cases showing field defects due to involvement of radiation or cortex were included in this study. In all but 3 cases the defect was caused by a penetrating skull wound with resultant damage to brain tissue by the missile or in driven bone fragments. The visual defects of the remaining 22 occipital lobe lesions varied from congruous homonomous scotomas through congruous homonomous hemianopsia to congruous loss of three-quarters of the peripheral field.—*Author's abstract.*

Chronic Progressive External Ophthalmoplegia. *K. K. Hussain, London, England.* Brit. M. J. 2: 1392-93, Dec. 17, 1949.

A man of 39 developed ptosis of left eye at the age of 36. Three years later he had nuclear opthalmoplegia with sparing of the Edinger-Westphal nuclei. There were no other physical signs and nothing significant discovered in the family history or previous illnesses. All investigations proved negative.

In 1900 Wilbrand and Saenger considered this to be a distinct clinical entity and the above case so far conforms accurately with their description. Since then very few cases belonging strictly to this group have been reported notably by Altland, McMullen and Hine and Farias. Langdon and Cadwalader have published post-mortem and histological reports.

Cases whether familial, myopathic, or, involving other parts of the central nervous system, probably do not belong to this idiopathic group. Since the prognosis is favorable in the Wilbrand and Saenger syndrome (so far as the disease remains confined to the oculomotor nuclei) I believe it deserves to remain a distinct clinical entity at least until the pathogenesis is elucidated. 14 references.—*Author's abstract.*

Perimetry. *Dan M. Gordon, New York, N. Y.* Presented at The American Academy of Ophthalmology and Otolaryngology, 1949.

Perimetry is the the study of the geography of vision, with especial reference to its boundaries and their contents. The proper interpretation of the visual field is dependent upon a knowledge of the neuroanatomy of the visual pathways plus an adequate history and ophthalmologic (or neuro-ophthalmologic) examination.

The visual pathways include all of those sensory structures which take part in the act of vision: the eye (especially the retina and choroid), the optic nerve, chiasm, tracts, geniculate bodies, optic radiations and the occipital cortices, as well as those contiguous structures whose lesions might affect the visual pathways.

The arcuate arrangement of the nerve fibers coming into the nerve from the temporal retina, the papillomacular bundle, the horizontal raphe and the cuneate arrangement of the nasal retinal fibers all make for facility in interpretation of lesions of these parts.

The retinal vessels are end vessels, lacking anastomoses, and supplying only a portion of the entire retinal thickness; the remainder is supplied with nutrition by the choroid.

Retina and Choroid: Perimetrically, the visual field is divided into four quadrants by a + through the macula; as differentiated by the division of the retina into four quadrants by a + through the optic nerve. Hence, all of the retina nasal to the vertical bar of the + is nasal retina as far as interpretation of the visual field is concerned and is responsible for the temporal field.

The retinal vessels furnish nutrition to specific quadrants of the retina. Vascular occlusion affects the quadrant supplied by the specific vessel and gives characteristic field changes which shall be discussed later.

All lesions of the retina (or choroid), as well as lesions elsewhere in the visual pathways, are reflected inversely in the visual field; i.e., a lesion in the superior temporal quadrant of the retina causes a defect in the inferior nasal field, etc.

Congenital and acquired anomalies are important in modifying the interpretation of the fields.

The Optic Nerve: The relations of the retinal fibers in the optic nerve tend to be similar to those in the retina, especially on the cranial side of the point of entrance (and exit) of the central vessels to the retina. The important qualifications of this statement will be given and illustrated.

The relationships between the nerve and its surrounding structures, sinuses, superior and medical recti which partially originate from it and which are involved in inflammations of the nerve, frontal lobe and olfactory tract, the carotid artery and its branches, are emphasized.

The Chiasm: In the chiasm the fibers of the two nerves spread out and become intermingled, later reforming into a specific pattern, with the nasal fibers of one side (i.e., right) crossing over to run backwards on the other side with the uncrossed or temporal fibers of that side (i.e., left).

The relations of the chiasm with the adjacent structures, especially the sella and pituitary body below, the anterior wall of the third ventrical superiorly and posteriorly and the anterior cerebral arteries above, are of the greatest importance in the causation of chiasmal lesions.

The Optic Tracts: The optic tracts lie between the chiasm and the external geniculate bodies. Here there is an imperfect intermingling of the crossed and uncrossed fibers. The fact that the nasal fibers of one side do not lie in perfect apposition with the temporal fibers which represent visual field counterparts is important in interpretation of homonymous hemianoptic field defects, which are caused by lesions of the optic tracts and radiations.

The Optic Radiations: These begin beyond the geniculate bodies and terminate in the occipital lobes along the calcarine fissures. The fibers here are intimately related with the other motor and sensory fibers in the internal capsule. Here the crossed and uncrossed fibers representing identical points on the two retinae lie so closely together that a single lesion produces congruous (superimposable) field defects. The fibers of the upper retinal quadrants go to the upper lip of the calcarine fissure, the macular fibers to the occipital pole, and the inferior fibers to the lower lip of the fissure.

The Visual Cortex: This includes, mainly, the medial aspect of the posterior pole of each occipital lobe with a small portion of the adjacent lateral surface and is conspicuous by the presence of the white line of Gennari.

Analysis of the Visual Fields in Localization of Lesions

Retina and Choroid: Lesions of the retina usually involve the choroid and vice versa. Hence, their lesions may be considered as one, perimetrically. Lesions which create ophthalmoscopic changes usually give field defects resembling the ophthalmoscopic picture. If the overlying nerve fibers are involved, a nerve fiber bundle defect will be added. Lesions involving only the percipient elements may not cause ophthalmoscopic changes and tend to give a greater defect for blue than for red, as opposed to nerve fiber (conduction) lesions in which the reverse is true. Lesions of the retina and of the nerve tend to be unilateral.

Nerve fiber bundle defects reflect their anatomic distribution and configuration and may be due to lesions within the retina or nerve. They are most characteristically involved in choroiditis juxtapapillaris and glaucoma.

Macular disease tends to cause complete or incomplete scotomata (central) of from 5 to 10 degrees.

Arterial branch occlusion gives a fairly quadrantic field defect with its apex at the blind spot in contradistinction to the hemianoptic quadrantic defects of the chiasm, tracts and radiations, which have their apices in or pointing at the macula (fixation).

The field defect in retinal detachments usually corresponds to the area of detachment unless a balloon of detachment overhangs normal retina.

Perimetry is of little value in disseminated chroiditis.

In retinitis pigmentosa the first defect is a scotoma in the midperiphery which expands concentrically to form a ring scotoma. This, then, expands towards the periphery and towards the center, first wiping out the periphery and isolating a central area of about 10 degrees. This, too, is eventually choked down until blindness ensues.

Glaucoma

Perimetry is recognized as the most important single prognostic test in chronic glaucoma.

The essential lesion here is a nerve fiber defect probably on a vascular basis.

The earliest field defects manifest themselves as baring of the blind spot (failure of the field with a small white target [as 2/1000] to encircle the blind spot), enlargement of the blind spot, and the appearance of a small scotoma above or below fixation which later expands towards the horizontal raphe and the blind spot to manifest itself as a typical nerve fiber bundle defect. Since the temporal fibers are characteristically involved first, the defect is an arcuate one, with a straight horizontal line termination in the nasal field, giving the so-called Ronne's nasal step. The arcuate defect forms the typical Bjerrum scotoma.

Eventually, two arcuate scotomata arising above and below fixation isolate the centrocecal area. The center is then isolated from the blind spot, and as the process continues it slowly chokes fixation until it is lost. At this stage a small temporal island usually persists, but later it, too, is lost.

Optic Nerve Lesions

Traquair's classification of optic nerve lesions is followed here:

I. Intoxication and inflammation. a) The toxic amblyopias. b) The various forms of retrobulbar neuritis, descending neuritis, and some atrophies without obvious preceding swelling of the optic disk.

II. Pressure.

III. Plerocephalic edema (due to increased intracranial pressure).

IV. Vascular disease.

V. Traumatism.

Most lesions tend to fall into the first group due to exogenous or endogenous toxins. Most of the toxins tend to affect specifically either the papillomacular bundle or the peripheral fibers.

I-a. The Toxic Amblyopias

Group I—Those exhibiting bilateral centrocecal or central scotomata with little or no involvement of the peripheral field; most commonly, tobacco, alcohol, lead, carbon bisulfide and inorganic arsenic. 1) Tobacco. Typically bilateral although one eye may be involved before the other. The defect is centrocecal, resembling a dumbbell lying on its side, and may have one or more denser areas of more absolute blindness. Rarely leads to complete blindness. The work of Carrol indicates a vitamin B (thiamin) deficiency as an important factor in the production of tobacco-alcohol amblyopia. 2) Alcohol. This is usually on the basis of the contained impurities, especially fusel oil, offenders. The field changes depend upon the stage during which the patient is seen and may range up to complete blindness (death may ensue). There may be blindness followed by temporary improvement, which in turn is again followed by blindness due to contraction of scar tissue which has been formed within the nerve. If blindness does not ensue, complete recovery of the peripheral field usually results in a dense residual central scotoma, which may be broken through on one side. It lacks the typical centrocecal configuration of tobacco defect. 3) Lead. This gives a central scotoma, which may be absolute and with the periphery unaffected. Systemic changes may be present, including increased intracranial pressure. 4) Carbon bisulfide. Here, too, central defects which usually extend more to the temporal side are caused. 5) Inorganic arsenic rarely causes an amblyopia with central scotomata.

Group II—Bilateral depression of the fields without or with involvement of the central area. 1) Quinine. This can cause a temporary dimness of vision or complete blindness. As recovery sets in it is much more conspicuous centrally, so that fairly good vision may be found in the presence of a contracted peripheral field which is compressed vertically. Recovery takes place over a period of several months, with some peripheral loss or depression usually remaining. The fields may take on a quadrantic or hemianopic aspect due to the irregular course of recovery. The lesion is probably due to intoxication of the ganglion cells and nerve fibers, as well as of the percipient elements. Ring scotomata may be found. 2) Optochin (ethyl hydrocupreine hydrochloride) is more toxic to the visual cells than is quinine and is distinguished by the frequent occurrence of central scotomata with or without peripheral changes. 3) The salicylates may resemble quinine in their field defects. 4) Organic arsenic rarely causes defects; though it may. Tryparsemide tends to resemble quinine. However, the field defect, which is usually

peripheral, resembles two shoe tracks standing vertically in the field with peripheral depression outside the tracks.

I-B. Inflammations of the Optic Nerve. 1) With visible ophthalmoscopic signs. 2) Without visible ophthalmoscopic signs.

Inflammation may affect any portion of the nerve up to and including its complete cross section. It tends to come on suddenly, usually unilaterally, most commonly in females under 50 (frequently as a premonitory sign of multiple sclerosis), most commonly affects the papillomacular bundle, and tends to resolve slowly. The field defect is entirely dependent upon the portion of the nerve involved, but it is usually manifested as a dense central scotoma of 10 to 20 degrees in diameter and may include the blind spot. If the nerve is involved at its entrance into the chiasm, the so-called "junction scotoma" may be found. This is a quadrantic-shaped central scotoma, with or without peripheral changes. Arcuate or ring defects may also be found in nerve disease. Recovery, when it occurs, may take weeks or months and often occurs when all hope has been given up. The bilateral forms are often associated with systemic nervous disease, as in neuromyelitis optica, Leber's disease and meningo-encephalitis.

Chronic forms of nerve inflammation occur rarely and exhibit field defects resembling the more acute forms.

The field defect is a reflection of the portion of the nerve involved and the intensity of the process. As a rule the defect is disproportionate, varying in size with the size (and color) of the target used, and hence indicates (usually) an uneven and incomplete involvement of the nerve fibers. The diagnosis of retrobulbar neuritis must always be kept in mind in the presence of a normal appearing disk with sudden visual disturbance and central scotoma, especially when unilateral.

Multiple sclerosis is among the more common etiologic agents, as are the other demyelinizing diseases. Sinus disease may be responsible. In many cases the etiologic agent is never discovered.

Tabes—Progressive Optic Atrophy. Tabes causes a primary bilateral optic atrophy, with no visible signs of nerve inflammation. One eye may be involved before the other. Either local or general depression, or both, may be found.

The local form causes sector defects or nerve fiber bundle defects which are usually quite dense. The general depression form is usually first found with colored targets, denoting involvement of the more internal isopters. As it increases, contraction can be found with white targets. In the rapid cases there is a pronounced disproportion in the size of the field for white as compared to color targets, so that a very contracted field may be found for colored targets in the presence of a good central vision on the Snellen chart.

Central scotomata are complications of tabetic atrophy and do not tend to occur alone. Rarely the disease begins in the chiasm with chias-

mal signs. Field signs may precede ophthalmoscopic evidence of nerve involvement. Small and colored targets should be utilized in suspected cases. Bizarre field defects should make one suspect optico-chiasmic arachnoiditis.

The prognosis of these atrophies is not good. These cases should be treated in conjunction with a competent syphilologist in an attempt to halt the progress of the disease. At this time there is evidence to indicate that penicillin therapy has no effect on the course of the atrophy, and that fever therapy (as by the use of malaria) still remains our most effective weapon.

II. Pressure: Here the conduction via the nerve is interfered with by local pressure, as by a tumor within the nerve sheath or external to it. These are commonly unilateral, producing wide sector depressions, which may be hemianopic or quadrantic, and first affecting the internal isopters. Central scotomata are frequent. Recovery is dependent upon the stage at which surgery is performed and upon the amount of extension of the neoplasm which may invade the chiasm and the opposite side. The progress is gradual and is usually accompanied by pallor of the disk on the affected side. X-ray of the optic foramina may show an eroded foramen on the affected side.

This must be differentiated from retrobulbar neuritis, which is more sudden in onset. In the Foster Kennedy syndrome pallor of the disk is seen first on the affected side, accompanied by loss of sense of smell on that side, with later papilledema on the opposite side.

Binasal Hemianopsia: This is thought to be due to distension of the third ventricle displacing the anterior angles of the chiasm outwards in such a manner as to compress the outer sides of the nerves against the carotids. It is rarely due to a single lesion and is frequently found in "soft glaucoma" where the nerves are deeply excavated. Occasionally x-ray evidence of plaques on the carotids is obtained. No single lesion may produce it by pressure alone, excepting as it causes the distension of the third ventricle referred to above.

III. Papilledema Due to Increased Intracranial Pressure: Traquair's term "pledocephalic edema," which he uses to denote papilledema due to increased intracranial pressure, has not gained widespread usage.

Papilledema is accompanied by enlargement of the blindspots, noted as a scotoma which may extend for several degrees about the blindspot and which may reach halfway or more to fixation. This change is due to the edema of the nerve, which pushes the percipient elements of the retina away from the nerve. If interference is overly delayed, atrophy follows and with it the accompanying depression and concentric contraction of the field. All other field changes depend upon whether the mass (tumor or aneurysm) produces local pressure upon the visual

pathways. Obviously, in order to prevent the permanent visual loss which accompanies atrophy, surgical interference should not be delayed.

IV. Vascular Disease: The ophthalmoscopic and perimetric pictures produced by vascular disease and occlusion tend to reflect the speed of onset of the lesion and the site of the lesion. The prognosis depends upon the degree of deprivation of blood supply to the affected part and is usually not good.

V. Trauma: As a result of trauma the nerve may be injured with or without x-ray evidence of fracture. The nerve may be completely severed or damaged by hemorrhage. The most common story is one of a fall with head injury or of a blow to the temple. Frequently the other symptoms of the head injury are so severe as to cause one to overlook, temporarily, the unilateral loss of vision. Obviously, the amount of recovery is dependent upon the amount of injury to the nerve. Davison has reported on unilateral blindness due to hemorrhage within the nerve sheaths. The trauma may be directly to the nerve or to its vascular supply.

The Optic Chiasm

The specifically peculiar arrangement of the nerve fibers within the chiasm, plus the danger of exposure to the enlargements and inflammations of the various structures in this region (both intrasellar and extrasellar) renders this region particularly suitable for perimetric diagnosis.

Typically, the field defect is that of a bitemporal hemianopsia, usually starting as a bitemporal quadrantopsia, which is usually more advanced on one side than on the other. This is the only site where a single lesion can simultaneously involve both temporal fields. Unfortunately, the average student forgets that most growths (either below or above the chiasm) are rarely exactly in the midline and, hence, may not typically involve both temporal fields in a similar manner. A study of the chiasmal relations and possible tumor (neoplasm or aneurysm) sites make it evident that any bilateral field defect which involves the temporal field on at least one side and which does not readily fit into some other regional classification (as a homonymous hemianopsia or bilateral nerve defect) must be suspected of being chiasmal until proved otherwise.

Schaeffer's demonstration that the relation of the chiasm to the sella turcica is not always constant indicates another reason for variability in the field pictures. According to him, 79 per cent of patients tend to have their chiasm lying over the posterior part of the sella, 5 per cent are prefixed, and 4 per cent postfixed.

The pituitary tumors cause pressure on the under side of the chiasm and, hence, typically give rise to a bitemporal quadrantopsia of a superior type (affecting the upper temporal quadrants). If unchecked,

these fields then tend to progress in a typical fashion: the right proceeds to involve the other quadrants in a clockwise fashion, the left counter-clockwise.

Suprasellar growths, conversely, cause inferior quadrantopsias, which then proceed to involve the rest of the field in a manner similar to the above. Schlezinger, Alpers and Weiss have shown that suprasellar meningiomata may begin with sudden visual loss, scotomata, (usually central) and headache. These are frequently confused with retrobulbar neuritis, from which they may be differentiated by the persistent headache and temporal defects. Unless careful perimetry is done here (including central fields) one may find a unilateral temporal field defect and overlook the central scotomata on one or both sides.

Early quadrant involvement may be missed if one fails to employ small targets or relies upon peripheral field study alone. The apex of the quadrant defect is in or points at fixation; while those defects which completely involve the whole (or practically the whole) temporal field tend to bisect fixation.

As the macular fibers are thought to lie in the posterior portion of the chiasm, pressure here tends to involve the macular fields. Occasionally the central fields are found involved when the pressure is anterior to the chiasm. Here, the pressure from in front may be causing the posterior portion of the chiasm to press upon the sella, causing the macular field changes.

A study of the chiasm and its relations renders it evident that the pressure may begin, initially, on the outside of the chiasm, causing initial field changes due to involvement of the temporal retinal fibers, going on to involve the nasal fibers, and then crossing over to involve the nasal and later the temporal retinal fibers on the other side.

Adhesions about the chiasm due to an adhesive arachnoiditis tend to cause bizarre field changes which may not be diagnostic in nature.

No single lesion can cause a binasal hemianopsia. These have been demonstrated in "soft glaucoma," which occasionally can be proved to be due to calcified plaques on the carotids causing pressure on the nerves (McLean and Ray).

Chiasmal defects tend not to produce papilledema. Pituitary tumors are commonly associated with pale nerve heads. Suprasellar meningiomata may be associated with the Foster Kennedy syndrome of optic atrophy, loss of sense of smell on the side of the tumor and, later, papilledema on the opposite side.

The field defects in chiasmal tumors are usually slowly progressive, although aneurysm or hemorrhage into a tumor may cause sudden onset or progression. Intrasellar tumors tend to cause demonstrable radiographic changes before field changes are produced. The extrasellar lesions may cause more difficulty in diagnosis; chiefly, suprasellar men-

ingiomata, extrasellar pituitary adenomata, craniopharyngiomata, aneurysms, chiasmal retrobulbar neuritis, and adhesions.

The amount of recovery following successful surgery is dependent upon the amount of nerve fiber destruction already present. Excepting in advanced cases, it is usually good and retraces the stages of original development.

The Suprachiasmal Pathways

The part of the visual pathways between the chiasm and geniculate bodies is known as the optic tract; the geniculocalcarine tracts form the optic radiations. Behind the chiasm the association between the nasal fibers of one eye and the temporal fibers of the other is such that a single lesion will tend to involve somewhat corresponding fibers from the nasal retina of the opposite eye and the temporal retina of the involved side. This, in the case of a lesion on the right side, results in a defect in the right nasal and left temporal fields (due to involvement of the right temporal and left nasal retinal fibers), the so-called left homonomous hemianopsia. Because of the fact that fibers from corresponding points of the nasal retina of one eye and the temporal retina of the other tend to lie together, the field defects tend to resemble each other. Above the geniculate bodies this intimacy between fibers from corresponding points is more perfect than in the tracts so that lesions here (in the radiations) tend to give identical or congruous field defects in the involved half fields, as opposed to the less congruous (incongruous) field defects due to tract lesions. There is an important qualification to this statement. The outer limit of the temporal field is about 75 to 90 degree from fixation, depending upon the size of the target employed; the border of the nasal field is about 60 degrees from fixation. Hence, if the nasal half field is superimposed on the temporal half field of the other side there will be a temporal crescent of about 30 degrees in the temporal field which has no analog in the nasal field. Therefore, a lesion in the radiations will produce two similarly shaped field defects (in the nasal field of one eye and the temporal field of the other) with the defect in the temporal field usually being larger temporally. By the same token, if both half fields are completely involved in a radiation lesion, the area of blindness will extend out towards 90 degrees in the temporal field and towards 60 in the nasal. Rarely, the lesion will cause complete or practically complete loss of the nasal half field with a similar congruous loss of the temporal half field, but with retention of field (and vision) in the temporal crescent.

Defects in the visual centers in the occipital lobes tend to cause superimposable (congruous) defects of a scotomatous nature.

Lesions involving the tracts tend to give field defects which invade the fixation area; those involving the radiations and occipital cortices tend not to involve fixation (so-called macular sparing). When the

field defect is due to occipital lobe injury, invasion of the macular area is much more common than when the lesion is vascular.

Whereas field defects of a chiasmal nature are practically always due to pressure of a growth, the farther back one goes in the suprachiasmal pathways the more one finds vascular disease as the etiologic factor. Tumors and vascular accidents in the suprachiasmal pathways frequently tend to involve other sensory structures (because of their close relationships here) and hence may give localizing signs—aphasias, etc. Defects due to vascular disturbances tend to remain stationary or may even become slightly smaller as the surrounding edema disappears. Defects due to growths tend to be progressive and, if close to the chiasm, may involve it and thus disturb the homonymous character of the fields. They may also involve the macular fibers at the posterior portion of the chiasm.

Adolf Meyer divided the radiations into dorsal, lateral and ventral bundles. The first two pass directly back to the occipital lobe, while the ventral bundle (Meyer's loop) is prevented from doing so by the anterior horn of the lateral ventricle. Thus, they are directed down and forwards into the uncinate region of the temporal lobe, passing over and around the anterior horn of the lateral ventricle and thence turning sharply backward to the anterior part of the inferior calcarine area. A lesion such as a temporal lobe tumor catching the ventral bundle (or Meyer's loop) will give a superior homonymous quadrantopsia which is usually incongruous and which is usually right angled, so that the field defects tend to resemble two pieces of pie in shape.

A lesion (usually vascular) may cause a complete homonymous hemianopsia on one side and then be succeeded by another lesion causing a complete homonymous hemianopsia on the other side, so that complete blindness will ensue (unless there has been macular sparing). It would seem that the term "double homonymous hemianopsia" would be valid if one could prove that the two homonymous hemianopsias were successive, or if, in the case of a simultaneous involvement of all four fields, there was macular sparing.

Functional Changes

Field changes of a functional nature occur in individuals who are usually suspect of having functional disturbances. As a rule they tend to be of a type which cannot be caused by organic changes. Typically, one finds the tubular fields of hysteria or the star-shaped exhaustion fields of neurasthenia. Very disturbed fields, with or without poor vision, on the Snellen chart in an individual who navigates without any difficulty should cause one to suspect functional disturbance.

This author likes to perform the following test on these people with "poor vision" and "tubular fields." He takes them into a dark room in which many stools or chairs have been previously so placed that only

one with good vision and field can safely make his way through them.

Malingering is ruled out with the usual tests for this condition.—*Author's abstract.*

Differential Diagnosis of Papilledema and Optic Neuritis. *P. J. Leinfelder, Iowa City, Iowa.* Presented at the American Academy of Ophthalmology and Otolaryngology, 1949.

Edema of the nerve head is a nonspecific local change in the optic disk that may result from a variety of causes. Choked disk and optic neuritis are types of edema that are of specific etiology, the former being associated with increased intracranial pressure, while the latter results from inflammation of the intraocular portion of the optic nerve. Since the appearances of these two forms of edema of the nerve head frequently are the same or quite similar, it may be difficult to differentiate them ophthalmoscopically. In each condition edema is usually limited to the nerve head and a narrow band of retina immediately surrounding it; the veins are engorged and hemorrhages may occur. In inflammatory edema the recognition of slight dilatation of the arteries may be difficult and vitreous opacities may be absent. Therefore it is commonly accepted that ophthalmoscopic differentiation is unreliable, and recourse must be taken to other clinical evidence that may assist the examiner. The most important sign is change in the visual acuity, for in neuritis there is usually initial failure of central visual acuity, which may progress to light perception or complete loss. In choked disk, visual change occurs very gradually over a period of months and is observed as concentric contraction of the visual field rather than as loss of central acuity. Progressive graying of the nerve head because of atrophy is noted along with the field changes. However, all cases of papillitis are not accompanied by loss of visual acuity, and in some instances early loss of vision may occur with choked disk because of pressure on the visual pathway. Visual field tests are helpful under these circumstances because an intracranial process will cause changes in the visual fields of both eyes while papillitis will have no effect upon the sound eye. If the inflammation is bilateral and visual fields can be obtained, no change will be found in the peripheral limits of the fields, for a central defect is the characteristic change. Associated general signs are often helpful, for localizing signs may occur with brain tumor or abscess. However, occasionally it may be necessary to do ventriculography or encephalography for diagnosis.

The appearance of optic neuritis may vary from the usual localized swelling to a more generalized edema of the nerve head and a large area of the surrounding retina. The occurrence of loss of vision is the same as in the more typical condition.

In any attempt to make a diagnosis one must be cognizant of the possible causative agents. In choked disk increased intracranial pressure is responsible, but this may result from tumor, abscess, edema of the brain secondary to general disease, ruptured intracranial aneurysm, adhesive arachnoiditis, and idiopathic intermittent swelling of the brain. Optic neuritis may occur as a result of meningovascular syphilis, meningo-encephalitis, meningitis, multiple sclerosis, Leber's disease, uveitis, or intoxication by methyl alcohol or lead. The possibility of these etiologic agents must always be kept in mind.

Besides the consideration of the above-mentioned etiologic conditions, differentiation must be made from occlusion of the central vein in which there is edema of the nerve head, hemorrhages in the retina, and loss of vision. Neuroretinitis of hypertension, arteriosclerosis, nephritis, and leukemia may be confusing because of the edema of the nerve head and retina and loss of vision; however, the obvious changes in the retina that are typical of each disease should readily allow accurate diagnosis.

The treatment of choked disk is directed toward relief of the cause for the increased intracranial pressure. Optic neuritis may resist all methods of treatment and in due time may come to complete recovery, but in many instances there is permanent loss of vision, and optic atrophy eventually occurs. Usually one attempt to eradicate the underlying disease (syphilis) if possible, but lacking that, vasodilators and fever treatment are advocated. It is doubtful that nasal surgery accomplishes anything more than palliation that might be accomplished as well with leeches.—***Author's abstract.***

Chiasmal Syndromes. *Arthur M. Culler, Columbus, Ohio.* Presented at the American Academy of Ophthalmology and Otolaryngology, 1949.

Familiarity of the ophthalmologist with the chiasmal relationships contributes as much to accurate pre-operative diagnosis in this neighborhood as the newer aids such as arteriograms and electro-encephalographic tracings.

The usual concept of the crossing of the bundles from the nasal half of the retina is an insufficient basis for interpretation of field defects caused by lesions involving this area. There are six nerve bundles in each optic nerve. Each of these pursues independent pathways through the nerve and chiasm and the relationships of these nerve bundles should form the basis of field analysis.

Field defects tend to become more symmetrical with progressive backward location of lesions in the optic pathways. When bizarre field defects do not correspond to fundus lesions, the first step in analysis should be the checking of the nerve bundles involved on this list: right

and left, temporal and nasal macular bundles, right and left superior and inferior temporal quadrants, right and left superior and inferior nasal quadrant bundles. The second step should be an analysis of the position where the various bundles lie in closest approximation. Adler's method is recommended. The third step should be the correlation with other pertinent eye findings, in particular, associated papilloedema, optic atrophy, and extraocular palsies. The fourth step should be a consultation with the neurologist and correlation of the ophthalmological and other findings. Such coordination is indispensable to the neurological surgeon and makes this one of the most interesting phases of ophthalmology.

A review of chiasmal relationships illustrated by anatomical sections reveals that the chiasm does not rest on the diaphragma sellae but that it is normally separated from it by 4 to 10 mm. The most intimate relationships of the chiasm are vascular, the circle of Willis lying in contact at several points. The anterior cerebral arteries may be over the junction of the optic nerves and chiasm or any part of the chiasm. The basilar cistern of which the chiasm forms the anterior inferior wall is important due to the gravitation of exudates into the optic recess in inflammatory states, the presumed cause of opticochiasmal arachnoiditis.

Of the field defects typical of pressure on the chiasm or optic nerves from various directions, binasal hemianopsia deserves particular attention. Francois' explanation on the basis of close relationship of the anterior cerebral arteries is founded on a study of the reported cases in the literature and explains the occurrence of this type of defect in visual fields with papilloedema, due to a remote lesion. When associated with optic atrophy binasal hemianopsia is usually due to opticochiasmal arachnoiditis. Typical neighborhood syndromes include the following: lesions of the apex of the orbit, aneurysm of circle of Willis, cavernous sinus thrombosis, arteriovenous fistula in cavernous sinus, opticochiasmal arachnoiditis, pituitary tumors, craniopharyngioma, meningiomas.—*Author's abstract.*

Glaucoma and Hypotony

Acute Secondary Glaucoma Due to Spontaneous Rupture of the Lens Capsule. *H. Saul Sugar, Detroit, Mich.* Am. J. Ophth. 32: 1509-13, Nov. 1949.

The cause of the glaucoma in spontaneous lens-capsule rupture is important. Three possibilities are apparent: 1) chemical irritation by lens substance, 2) increased protein content of the aqueous which tends to lessen the osmotic differential between the aqueous and the blood serum, and 3) obstruction of the trabecular spaces by particles of lens

substance. The first is the only condition which appears to be present in every case.

The clinical picture of anterior capsule rupture with secondary glaucoma is that of an acute attack of glaucoma in an individual with a history of a morgagnian cataract of several years duration. The aqueous is cloudy but no mutton fat deposits are present on the posterior corneal surface. In a case reported by me, it was impossible to distinguish optically the separation between the posterior corneal surface and the anterior chamber. The holes in the capsule may be seen only after the aqueous has been cleared. If the tears are large, the picture is complicated by the presence of fibrin and severe inflammation.

Treatment of secondary glaucoma due to anterior capsule rupture is anterior chamber puncture, which may completely relieve the symptoms and return the tension to normal. Recurrence is likely. For permanent cure, lens extraction is indicated. If the capsule tear is large, anterior chamber puncture may be inadequate.

With the posterior lens capsule rupture, the diagnosis is more difficult. Some haziness of the aqueous is usually present but congestion is not usually as marked. No tear is visible by slit lamp examination of the anterior capsule. The treatment is lens extraction. 12 references. —*Author's abstract.*

An Operation for Primary Glaucoma: Goniodialysis Combined with Sclerectomy and Iris Inclusion. *Joseph Laval, New York, N. Y.* J. Intnat. Coll. Surgeons 12: 869–72, Nov.–Dec. 1949.

The purpose of the operation is to cut the trabeculae of the filtration angle (goniodialysis or goniotomy), excise a piece of sclera and draw out one pillar of the iris under the conjunctiva. In this way, it is expected that Schlemm's canal will be able to function again and that the iris inclusion will carry some of the filtration load externally under the conjunctiva. The operation successfully controlled the tension in all the patients except one. The latter was a colored male with syphilis whose tension was not controlled with any operation including cyclodiathermy as a last resort. The operation can be used in primary glaucoma (acute or chronic) and also in congenital glaucoma. In the latter, however, the sclerectomy is omitted.

The operation is done as follows. A large conjunctival flap is prepared above as for a trephine operation. With a Tooke knife the corneo-scleral margin is clearly exposed. With a keratome or Graefe knife a 5 mm. incision is made horizontally 2 mm. above the limbus, the same way as is doing a cyclodialysis. When the uvea is exposed an iris repositor is inserted into the wound, hugging the undersurface of the sclera. The repositor is swept from side to side, cutting the trabeculae of the filtration angle. A piece of sclera, 1 × 3 mm. is excised.

The iris is withdrawn and cut as in doing a basal iridectomy, except that only one pillar is allowed to recede into the anterior chamber; the other pillar is placed on the sclera. The conjunctiva is then closed with a running suture, and 1% atrophine is instilled.—*Author's abstract.*

The Incidence of Glaucoma. *Gardner D. Phelps, Waterloo, Iowa.* J. Iowa M. Soc. 39: 519–20, Nov. 1949.

The author checked the intraocular pressure on all patients over 45 with tonometer readings. He reviews those patients seen in private practice over a one-year period. These he divides into two groups. The first group are those patients in whom a diagnosis of glaucoma was obvious by the standard criteria. The other group is made up of those patients in whom glaucoma was found through routine tonometer examinations of all patients over 45 years of age.

In the year's time 720 patients over the age of 45 were seen. Eighteen patients were found to have an obvious glaucoma, and nineteen patients were found who had a "hidden glaucoma." The eighteen patients with obvious glaucoma make up 2.5% of all admissions which is comparable to the statistics generally given for the incidence of glaucoma. The nineteen patients with "hidden glaucoma" make up about 2.5% of all admissions and this runs about the same as the incidence found on general surveys of groups in industrial plants, etc. over 45 years of age. The average age of patients with obvious glaucoma was 75 years. The average age of those with "hidden glaucoma" was 64 years. 6 references.—*Author's abstract.*

The Glaucomas: Definition, Mechanisms, Classifications. *Peter Kronfeld, Chicago, Illinois.* Presented at the American Academy of Ophthalmology and Otolaryngology, 1949.

A review of the literature of the last 10 years reveals that the overwhelming majority of ophthalmologists consider a pathologic elevation of the intraocular pressure to be the principal factor in the pathogenesis of the glaucomas. This view (hereinafter referred to as the conventional view) may be expressed as follows:

The ocular diseases comprised under the term "the glaucomas" are characterized by a progressive loss of visual function which runs parallel to and is in all probability directly caused by a state of elevated intraocular pressure (IOP). The ophthalmoscopic correlate of the glaucomatous loss of function is a type of optic atrophy in which the loss of nerve fibers is closely paralleled by the development of a characteristic excavation of the nerve head.

In the bulk of the glaucomas the parallelism between elevated IOP and loss of function is very close and obvious. Deviations from the parallelism postulated by the conventional definition occur too often to be considered mere exceptions. To encompass the atypical forms and phenomena of glaucoma observed clinically, the conventional view requires qualification. A list of the more important deviations from the postulated parallelism would have to include the following:

1. The existence of intermittent glaucoma.
2. The existence of low IOP glaucoma.
3. The fact of the progression of some of the far-advanced glaucomas despite normalization of IOP.
4. The existence of pseudoglaucoma.

The conventional view is opposed by Magitot's theory of the intracranial origin of glaucomatous optic atrophy. In Magitot's opinion, glaucoma is a disease of the diencephalon, causing widespread vasomotor disturbances with visual, endocrine, psychic and ocular manifestations. The glaucomatous optic atrophy originates just distal to the chiasm and descends from there to the eye. The vascular disorder within the eye may cause elevation of IOP.

Intermediate views are held by Schoenberg, Loewenstein, Posner and Elwyn.

Most of the evidence brought to light during the past 10 years supports the view of a peripheral, mechanical origin of many of the glaucomas.

The advent of gonioscopy has introduced new and apparently valuable criteria of classification.—*Author's abstract.*

Histopathology of Acute and Chronic Glaucoma. *Brittain F. Payne, New York, N. Y.* Presented at the American Academy of Ophthalmology and Otolaryngology, 1949.

The findings in acute and chronic glaucoma often record the progress of the disease and show considerable similarity. Eyes are seldom enucleated until every effort is made to save them. Therefore, the pathologic picture is altered by medical and surgical interference. In spite of these necessary alterations, one is able to review the sequence of events by a careful study of the microscopic preparations.

The clinical findings of acute glaucoma are projected in the pathologic sections. Examination with the low power microscope shows ciliary congestion, edema of the corneal epithelium, shallow anterior chamber, dilated pupil, congestion of the iris and ciliary body with similar changes in the choroid and retina. The optic nerve may or may not be excavated at this early stage. In general, acute glaucoma differs from chronic glaucoma in its congestive features as contrasted with those of degeneration in long standing cases. In globes with acute secondary glaucoma, it is almost always possible to find the inciting cause by diligent microscopic study.

Chronic glaucoma exhibits the following general characteristics: 1) pathologic changes in the corneal epithelium; 2) thinning of the cornea and sclera; 3) inflammation at the limbus; 4) shallowness of the anterior chamber; 5) Adhesions of the iris to the cornea and lens; 6) Inflammation of the iris and ciliary body; 7) Changes in the crystalline lens; 8) Pathologic depression of the optic nerve; 9) atrophy of the ganglion cells of the retina; 10) Unusual findings in the vitreous body.

The changes in the epithelium of the cornea consist of edema and, in advanced cases, separation of the epithelium from Bowman's membrane by fluid. The epithelium may regress and be undermined by pannus and calcareous deposits.

The layers of the cornea and the sclera show the effects of prolonged tension by generalized thinning and loss of cellular identification. In advanced cases, the sclera or cornea may bulge outward with a reinforcement of the uvea to form staphylomas.

Practically all specimens of chronic glaucoma show some congestion and inflammatory reaction at the limbus.

The anterior chamber is shallow in most cases with a narrow angle of the iris and peripheral adhesions to the cornea. In many cases, the iris is also fixed to the anterior capsule of the crystalline lens. If the iris angle is wide, there is usually definite closure of the drainage system, including the canal of Schlemm.

Both the iris and ciliary body show chronic inflammatory changes which may not be active but are demonstrated by atrophic changes.

A careful study of the crystalline lens presents swelling, nuclear sclerosis and cortical cataract.

A most constant finding is pathologic depression of the optic nerve as a result of prolonged pressure on the weak lamina cribrosa.

Until late in the disease the retina presents few visible changes other than atrophy of the ganglion cells.

The vitreous body appears swollen and cells and debris are often found in strands near its base. Late in the disease, a membrane may form in the vicinity of the ora serrata and some specimens show a detachment of the vitreous.—*Author's abstract.*

The Principles of Nonsurgical Treatment of Glaucoma. *Irving H. Leopold, M.D., Philadelphia, Pa.* Presented at the American Academy of Ophthalmology and Otolaryngology, 1949.

The prognosis for the preservation of visual function in an eye with glaucoma will depend on the stage of the disease at the time of normalization of the intraocular pressure. Narrow angle glaucomas respond better to miotics than wide angle glaucomas. The mechanisms responsible for the glaucoma in these two types are probably different and may account for the difference in response to miotic therapy. Usually our attention in the medical treatment of glaucoma is directed to

lowering the intraocular pressure, but we should not neglect a consideration and care of the patient as a whole.

The maintenance of the intraocular pressure in the normal eye is dependent chiefly on two factors; the rigidity of the ocular coats and the volume of the intraocular contents. These factors can be varied by many local changes such as (1) the state of dilatation of the intraocular capillaries, (2) the general blood pressure, (3) the relationship between the osmotic pressure of the intraocular fluids, (4) the degrees of turgescence of the sclera, (5) the state of swelling of the vitreous humor, and (6) the tone of the extraocular muscles.

The drugs used in treating glaucoma have their effect chiefly through their influence on the intraocular vessels and on the muscles of the iris and ciliary body, and, indirectly, through the motion of the ciliary body and iris on the scleral spur, on the venous drainage from the eye, on Schlemm's canal, and on the size of the angle of the anterior chamber.

Many new drugs have been introduced for the treatment of glaucoma in the past decade; namely, mecholyl, furmethide, doryl or carbachol, neostigmine or prostigmine, diisopropyl fluorophosphate, and tetraethylpyrophosphate. The mechanism of action of these drugs can be best understood by considering the chemical theory for nerve impulse transmission. All of these drugs have certain advantages and some definite disadvantages, a knowledge of which enables one better to prescribe and utilize them in the medical treatment of glaucoma.—*Author's abstract.*

The Principles of Surgical Treatment of Glaucoma. *Samuel J. Meyer, Chicago, Illinois.* Presented at the American Academy of Ophthalmology and Otolaryngology, 1949.

Surgery upon the glaucomatous eye is of major importance, for a high percentage of cases of that condition eventually requires surgical intervention.

Basically, the problem resolves itself in the fact that we have to deal with a rigid, inflexible, spherical envelope filled with: 1) tissues in which the volume varies only with the amount of blood in the vessels; 2) a gelatinous substance (the vitreous) the volume of which does not vary normally and which is practically incompressible; 3) a fluid (the aqueous) with a constant in and out flow which acts as a delicate balance-wheel in the maintenance of normal intraocular pressure.

Under ordinary conditions, intraocular pressure does not vary more than 4 to 5 mm. Hg. being held in equilibrium by an extremely complex regulatory mechanism. But when the mechanism no longer functions properly, the pressure rises so that it becomes necessary for the ophthalmic surgeon to endeavor to re-establish an equilibrium before the increased pressure has caused irreparable damage to the function of the eye.

It is obviously impossible to attack surgically the regulatory mechanism of intraocular pressure. Nor can the intraocular tissues be so manipulated as to re-establish normal pressure conditions. The vitreous is inert and plays only a secondary role. Hence, the only possible avenue of surgical attack is upon the aqueous. To influence the inflow of aqueous into the eye by surgical means lies beyond human capabilities, with one possible exception, namely, by the operation known as cyclodiathermy. Consequently, the only possible surgical attack upon the problem of hypertension lies in the endeavor to increase the rate or amount of outflow of aqueous, or both. At present there appear to be one major and one minor outlet for this one variable intraocular fluid. The former is via the angle of the anterior chamber, and the latter lies in the absorption from the crypts of the iris, which cannot be influenced by any known surgical procedure.

For practical purposes, cases of glaucoma are divided into the so-called narrow angle and deep angle types. The differentiation into these two types is necessary to tell us not only when to operate but also how to operate.

Acute Narrow Angle Glaucoma: Within the first 12 to 24 hours of an acute attack and when the tension can be controlled by mioties, a classic Graefe iridectomy is indicated. After this period, usually after 24 hours, anterior synechias have begun to develop and an iridectomy no longer suffices. An iridencleisis is then indicated, especially when the tension is not controlled by mioties, the iris is still normal, and no atrophic degenerative changes have occurred. Should the iris be atrophic a trephine or LaGrange sclerectomy may be the operation of choice.

Chronic Narrow Angle Glaucoma: If miotic therapy is successful in controlling the tension and the surgeon believes surgery is necessary to preserve the patient's vision, then an iridectomy may be attempted in cases where one believes no synechias are present. Iridencleisis is indicated when the tension cannot be controlled by mioties and the iris is not atrophic. The trephine and LaGrange sclerectomy may be attempted when the iris is atrophic. Cyclodialysis may be indicated when the chamber angle is open and there is a low grade hypertension with the use of mioties. It also may be performed as a secondary procedure when the fistulizing operations have been unsuccessful. Cyclodiathermy is indicated when all previous procedures have failed.

Chronic Wide Angle Glaucoma: In the early stages with slight elevation of tension on miotic therapy, cyclodialysis is the operation of choice. It results in practically no mutilation of the ocular tissues, may be repeated several times, and may be followed by the fistulizing operations if unsuccessful. With a moderately elevated tension on miotic therapy, iridencleisis may be attempted. A trephine or La Grange sclerectomy is indicated when the tension is higher and the iris

atrophic. A combination of an iridencleisis with sclerectomy may prove even more efficacious. Goniotomy is not indicated. Cyclodiathermy may be attempted when fistulizing operations have failed.

Secondary Glaucoma: Cyclodialysis is indicated in glaucoma secondary to lens extraction and may be repeated if unsuccessful. For other types of secondary glaucoma, either an iridectomy or the fistulizing operations may be resorted to, depending upon the type of pathology present. Cyclodiathermy is of definite value in many of these cases.

Congenital Glaucoma: The fistulizing operations have not resulted in many successes. Barkan's goniotomy should be performed, if the case is seen early.

The results obtained in surgical relief of hypertension depend upon the diagnostic ability of the surgeon, his comprehension of the pathologic anatomy involved, his knowledge of the modus operandi of the various surgical procedures, and his technical skill. In general, it may be said that fully 85% of all cases of glaucoma can be controlled, provided they are not seen too late and provided intelligent surgical judgment is used.—*Author's abstract.*

Treatment of Congenital Glaucoma with Beta Radiation. Report of a Case. *George M. Haik, Louis A. Breffeilh, and J. E. Boggess, New Orleans, La.* New Orleans M. & S. J. 102: 182–185, Oct. 1949.

On October 31, 1946, a five-year-old white male was admitted to the Charity Hospital Eye Clinic where a diagnosis of bilateral congenital glaucoma was made. This condition had been present from birth and both eyes were larger than normal and had deep anterior chambers. Corneal edema with patchy opacities were present in both eyes and were worse in the left eye. The intraocular tension was 48 in the right eye and 55 in the left eye.

The patient was admitted to the ward and 2% pilocarpine was started four times a day in each eye. On November 11 an Elliot trephine was performed on the left eye and on November 18 an identical procedure was carried out on the right eye. A prolapse of the iris and ciliary body in the filtering bleb resulted in an enucleation after all measures of treatment had failed. The pathological study reveals hydrophthalmos, perforated surgical wound, dislocated lens, detached choroid and retina due to hemorrhage, glaucomatous cupping of the disk, and chronic uveitis.

On December 20, the patient was discharged, using prostigmine 2½% and pilocarpine 2½% alternating six times daily. He was seen in the clinic on September 13 and at this time the tension was 40 and he was readmitted. During his stay in the hospital, tension taken daily did not remain controlled.

Research in the use of radium as a possible therapeutic agent for glaucoma was being studied in the ciliary body of rabbits by the Department of Ophthalmology of the Louisiana State University School of Medicine, and it was decided that this measure could be used in the treatment of this case in which all previous treatment had failed. Beginning on October 2, 50 mg. of radium screened by 1/10 mm. of monel metal in an Iliff applicator was applied over the ciliary body at nine and three o'clock for ten minute periods. The total dosage of 50 minutes was given.

Following the treatment with radium, all medication was discontinued on November 20 and the patient was discharged on December 22. Readings of the intra-ocular tension were made on weekly periods. The latest tonometer readings taken are: March 2, Schiotz 32 mm.; March 9, Schiotz 29 mm.; March 23, Schiotz 13 mm.; March 30, Schiotz 29 mm.; April 6, Schiotz 26 mm.; April 13, Schiotz 23 mm.; April 27, Schiotz 27 mm.; May 5, Schiotz 27 mm. 4 references.—*Author's abstract.*

Lacrimal Apparatus

An Operation for Removal of the Lacrimal Sac and the Formation of a Fistula into the Nose. *H. Pichette, J. Audet, and C. Gelinas.* Laval Medicale, 15: 31–43, January 1950.

There are a number of techniques described for the formation of a fistula through the lacrimal passages into the nose. The operation can be done from the exterior or intranasally. A fistulizing operation is preferred to removal of the lacrimal sac, which prevents drainage of the conjunctival sac. However, in some cases, such as fistulizing abscess of the sac, tuberculosis of the sac, osteomyelitis of the neighboring bone, cancer of the sac, dacryocystectomy is necessary. The authors therefore describe a procedure for removal of the lacrimal sac and formation of a fistula into the nose, or for formation of a fistula after the lacrimal sac has been removed.

The inferior canaliculus is dilated as a preliminary to operation. Next the region of the lacrimal sac is incised. If the sac is present it can be removed. A probe is passed along the lower canaliculus and its point is exposed, with the help of scissors, as it is driven into the lacrimal fossa. The frontal process of the maxilla, just anterior to the lacrimal fossa, is trephined down to the nasal mucosa. Then the nasal mucosa is incised and laid back against the wall of the trephined opening. A fine rubber catheter is passed along the lower canaliculus, through the lacrimal fossa, through the trephined opening, and into the nose. One end of the catheter is affixed to the cheek, the other end to the skin near the eyebrow. The wound is closed. The sutures are removed about the fourth day, the catheter about the fifth day. For

another week a sound is passed daily into the nose. Two successful cases are reported. 24 references. 5 figures.

Eyelids

External Diseases of the Eye: Differential Diagnosis and Treatment. *Ralph O. Rychener, Memphis, Tenn.* Presented at the American Academy of Ophthalmology and Otolaryngology, 1949.

Allergy of the Eye

Chemical dermatitis: (The cosmetic eye). Undoubtedly the most common of all disorders of the lids are those allergic reactions of the skin associated with a leathery, scaly dermatitis due to hypersensitivity to external contacts of the upper lids. The offending agent may be powder, rouge, lipstick, cleansing and vanishing creams, eyedrops, nail polishes, toothpaste; and, as one can readily understand from the above named agents, these reactions occur almost exclusively in women. Black dyes used in furs, felt hats, gloves, etc., are very common offenders, and it is occasionally necessary to insist on the exchange of a new fur coat. Stenographers exposed to the inks of certain typewriter ribbons, florists who react to flowers, and beauty parlor operators exposed to myriad contacts in the course of their work are particularly liable to this type of dermatitis. A careful history of the patient's occupational contacts is therefore of first importance in determining the etiology. A formaldehyde-sulfonamide resin is the allergen in nail lacquer (Simon).

The treatment is local and general. Locally it consists of removing the cause if this can be determined and of relieving the itching by the use of mild applications. In this respect calamine-zinc oxide lotion or thephorin ointment gives the greatest relief, while if the conjunctiva is involved, an eyewash of normal saline solution followed by one or two drops of solution of adrenalin (1:4000) every two hours is most effective. Occasionally zinc oxide ointment or the combination of equal parts of zinc oxide and 3% ammoniated mercury ointments will be necessary to remove the leathery scale from the lids.

General treatment includes the prohibition of the "seven C's"—cocktails, coffee, condiments, cigarettes, carbohydrates, chocolate, cosmetics.

Angioneurotic Edema: Sudden, violent edema of lids and conjunctiva is usually due to a food allergy, particularly seafoods. Saline purge is indicated. If edema is intense, iced applications will relieve.

Hay Fever: Allergy of conjunctiva and nasal mucosa to pollens. Some patients are permanently helped by desensitization. Ragweed is common cause. Usually climatic change to pollen-free region gives temporary relief. Estivin, proprietary preparation whose main con-

stituent is epinephrine, has wide vogue for local vaso-constrictor effect in relieving itching and lacrimation. Newer anti-histaminic preparations have promise—none specific.

Phlyctenular Kerato-Conjunctivitis: An allergic response by the corneal or conjunctival epithelium to endogenous toxin to which the individual has become sensitized. Usually in children with some metabolic defect; overweight, pasty complexions. Apparently sensitized to tuberculo-protein.

Lesion is a pustule of conjunctiva or cornea, resulting in ulcerations.

Treatment: dust calomel powder on lesion. Avoid iodine ingestion as a tonic or iodized salt, due to formation of corrosive red iodide of mercury. Later may use Pagensteecher's ointment, HgO; atropine if cornea is affected. Tuberculin therapy if skin test is positive. Remove foci of infection such as tonsils and adenoids. Cleanliness—frequent baths and washing of hands.

Diet: Low carbohydrate intake. Cod liver and halibut oil. Sanatorium regimen.

Vernal Conjunctivitis: A recurrent bilateral inflammation of conjunctiva, initiated by warm weather and relieved by cold, of unknown etiology. Palpebral conjunctiva show flat-topped papules of cobble-stone appearance. Bulbar conjunctiva may show gelatinous about the limbus. Cornea may be involved by ulceration.

Hypothesis: Agent is dust, aggravated by heat, in vagotonic individuals, exogenous and abacterial.

Treatment: Palliative only. Condition self-limited, 2-10 years. Cold climate, dark glasses, frequent lavage with ice cold boric or normal saline solution, followed by weak adrenalin drops, 1:4000. To remove stringy discharge, 1% solution of mono-hydrated sodium carbonate is best.

Beta radiation to everted conjunctiva in gross lesions is helpful.

Calcium in solution by injection, gluconate by mouth or as milk is widely used and helpful.

Affections of the Lids

Ecchymosis: The typical blue-black discoloration of the lids is due to hemorrhagic extravasation into the tissues, usually due to trauma. If the ecchymosis appears bilaterally several days after an injury to the head it is diagnostic of a basilar fracture of the skull.

Treatment: If unilateral and seen quite early, apply ice to stop the hemorrhage. Later the application of heat will aid absorption. For cosmetic purposes, flesh colored grease paint or "Covermark" may be applied to cover the discoloration.

Vitiligo: A depigmentation of the skin occurring occasionally after trauma or surgery to the lids is especially noticeable in Negroes. It also occurs without known cause in white individuals with darkly pig-

mented eyelids. The only available treatment is the cosmetic one of staining the discolored areas with a preparation of fluid extract of walnut or the use of "Covermark."

Phthiriasis Palpebrarum: Head lice, like many other diseases, are no respectors of social position and whenever a complaint of itching of the lid margins is obtained close inspection should be made to determine the presence of nits adherent to the cilia or of the active parasites themselves. The local application of 3% ammoniated mercury ointment or blue ointment will effectively eradicate the offenders. The nits must be removed from the individual cilia.

Blepharitis: Inflammation of the lid margins appears in advancing stages which may be classified as simple hyperemia, blepharitis. Diagnosis is easy, but treatment is difficult because of the prolonged course and poor response to treatment. Similar conditions obtain as in the treatment of meibomanitis and the possibility of refractive error, occupational allergy and focal infection must be considered.

Treatment: Consists in careful refraction under cycloplegia, removal of the scales or crusts and local application to the lid margins with such medicaments as brilliant green (2%), 2% silver nitrate. The home use of one's favorite ointment, such as 1% resorcin, 2% noviform, 5% sodium thiazole, 10% sodium sulfacetimide and one of two per cent yellow oxide of mercury has been of some help. Some cases will respond to epilating doses of x-ray; the eyeball must of course be protected by a lead or silver shield. Other cases will be helped by successive applications of fractions of an epilating dose. Brown advocates $\frac{1}{4}$ to $\frac{1}{3}$ epilating dose of x-ray weekly for three doses. If the blepharitis is accompanied by rosacea, riboflavin and Vitamin B Complex may be of value.

Hordeolum: Staphylococcus infection of the Zeiss glands at the lid margins.

If located at the outer or inner canthus, it may simulate a lesion of much greater magnitude than actually exists and is accompanied by intense swelling, redness and pain.

Treatment: If lesion is pointing, the only logical procedure is incision and drainage as in the case of abscess anywhere in the body. X-ray therapy will reduce the pain and local reaction. Frequent applications of moist heat are indicated both prior to, and after, incision. Frequently the relief of pressure obtained by incision is justification alone for this surgical procedure.

Manganese butyrate, 1.5 cc. intragluteally daily for three doses, has been recommended. Many practitioners state that the patient fails to return for the second injection because the painfulness of this treatment is frequently greater than the original disease. The value of antigenic ointments is questionable.

For recurrent styes, stannous oxide, gr. 1, may be given t.i.d. The

most satisfactory of all treatments for this condition is the internal administration of syrup of hypophosphites compound, drams 1 t.i.d., over a period of six weeks. Although medical schools teach that such preparations have no therapeutic value, the clinical results refute such teachings.

Meibomanitis: Characterized by a chronic infection of the meibomian glands from which pus may be expressed by vigorous massage of the lid margins. Recurrent chalazia occur as a result of this chronic infection and must be treated as chronic chalazia as stated in the paragraph below. There is usually some local or general cause for the lowered resistance of the meibomian glands, and allergy, eyestrain, focal infections, and general diseases must be considered. One such patient treated for more than six years with every conceivable form of therapy never obtained any permanent relief until an undiagnosed gall bladder infection became acute and was surgically cured; thereafter the patient's chronic eye condition was likewise permanently ended. Some cases responded to x-ray.

Local treatment: Should consist of massage of the lid margins at intervals, frequently enough to keep the glands free of pus. Moist heat, local antiseptic washes and eyedrops.

Chalazion: (a) Chronic: Diagnosis may be confused with epithelioma, but is usually relatively easy because of the location of the rather typical lesions in association with the position of the meibomian glands. Usually internal and easily accessible from the conjunctival surface, they occasionally burrow through the tarsal cartilage and lie externally to it, where they are best dissected away from the skin side. Logical treatment is incision and curettage after thorough anesthesia by local application of ½% pontocaine solution to the conjunctiva, injection of 1 or 2% procaine into the retrotarsal fold, and additional procaine injection on the external surface of the tarsus to the lid margin so as to surround entirely and block off the nerve supply to the lesion.

Marginal chalazia may be destroyed by electrocoagulation. The V-shaped excision of Wiener and Alvis is also applicable.

(b) Acute: Localized suppurative lesions in a meibomian gland may simulate the appearance of a deep abscess of the lid.

Treatment: Stab incision from the conjunctival surface, followed by moist heat and the application of a favorite antiseptic ointment, will result in prompt resolution. Usually a chronic chalazion remains which will require further curettage ten days or two weeks after resolution.

Insect Bites: As a rule the lid is found to be swollen upon awakening, and inspection discloses a tiny, white, slightly indurated area which marks the site of the bite, usually due to spider, bedbug, honey bee, mosquito, etc. The only treatment necessary is moist heat and time.

Erysipelas: Diagnosis is usually not difficult because both eyes are

involved with extension over the bridge of the nose producing a typical butterfly pattern of brawny, red edema with sharply demarcated edges.

Treatment: Sulfonamides have superseded all other forms of medication and have proved so satisfactory that streptococcus serum and local applications are no longer necessary.

Sebaceous Cyst: Diagnosis is usually easy because of long history of gradual enlargement of movable, subcutaneous, cystic lesion. May be present anywhere, but has a predilection for the upper outer quadrant of the orbit.

Treatment: Consists in clean dissection and removal of the entire cystic mass which rapidly recurs if any small portion remains behind.

Lid or Orbital Abscess: Intense swelling and pain in the lid associated with an indurated, circumscribed area in the body of the lid.

Treatment: Moist heat, incision, and one of the sulfonamides or penicillin if indicated.

Cavernous Sinus Thrombosis: Intense edema, venous engorgement of the lids and orbital tissues with proptosis of the globe; usually follows some trauma to the nose or upper lip with the extension of infection into the cavernous sinus.

Treatment prior to sulfanilamide has been entirely without avail. Occasional cure since the use of the sulfonamides, penicillin, and the anti-coagulants, heparin and dicumarol.

Subconjunctival Lithiasis: Due to amyloid degeneration of infarcts in the meibomian glands and the newly formed glands in the retrotarsal fold, minute white or yellow dots are frequently present under the conjunctiva in elderly people. These are popularly supposed to be transformed into limestone by the deposition of calcium, but Sisson by crystallography proved this was untrue. However, they may penetrate the conjunctiva where the sharp edges cause the feeling of foreign body in the eye.

Treatment consists in local conjunctival anesthesia and their removal with a short, sharply pointed knife.

Ulcerative Conjunctivitis with Preauricular Adenitis: This condition is present in ulcerative lesions of the palpebral conjunctiva due to tularemia, lepothrix or tuberculosis. Treatment depends on etiology which may be verified by smears and cultures from the ulcerative lesions, by blood examination or agglutination tests.

Trachoma: The diagnosis of this condition can often be made by a casual inspection where in the relatively acute stage, a typical type of ptosis is evident, or in the chronic stage there is a cicatricial entropion and its attendant sequelae will make the etiology evident.

Treatment of the former is by the use of sulfanilamide, $\frac{1}{4}$ grain per lb. of body weight in two evenly divided doses at 12-hour intervals carried out for a period of ten days. Loe guarantees against the transference of the virus after a complete course of treatment.

Hansen's Disease: Although not often seen in the course of every man's practice, leprosy is more common than we suspect. The characteristic leonine expression with changes of the eyebrows, skin of the eyelids, and cornea should keep us on guard. Chaulmoogra oil seems to be the only effective treatment.

Syphilis: May be present as primary lesion of conjunctiva due to accidental surgical contact. Formerly common in India where tongue was used to remove foreign bodies from cornea. Interstitial keratitis is common sequela of congenital syphilis, while gumma of lachrymal sac is most common late lesion. Specific treatment indicated for all forms.

Tumors of the Eyelids: (a) Benign: Xanthelasma, the most frequent of this type is a dark yellow, flat elevation due to a fatty degeneration in the skin of the lids. It occurs more frequently in women, usually confined to the inner halves of both lids, enlarges slowly, and causes no ill effects aside from the cosmetic disfigurement.

Treatment: 1) Excision has proved the most satisfactory and can readily be done in the office under procaine anesthesia if the lesions are not too large and too numerous. 2) The application of the thermaphore applied for one minute at 145° F. 3) Electrocoagulation. 4) Application of caustics. Some operators prefer solution of mercury bichloride in collodion which is painted lightly over the surface of the lesion. This causes much reaction with subsequent crusting with exfoliation and the appearance of new skin underneath it. Pure trichloracetic acid may be similarly applied with much less reaction and can be re-applied as frequently as necessary without discomfort to the patient. No deep scarring occurs, and the cosmetic results are satisfactory.

Warts, Cysts, and Cutaneous Horns occur with considerable frequency on the lid margins. Papillomatous lesions lend themselves most favorably to ligation with a fine silk thread which results in subsequent desiccation and disappearance without scarring in the course of 10 days. Diathermy or electro-desiccation is an easy and satisfactory form of therapy.

Cysts of Mall's glands occur on the lid margins and appear as clear cystic beads of minute proportion which give a very characteristic feeling of foreign body in the eye. They may be broken by pressure or scraped off with a sharp knife and need no further treatment.

(b) Malignant: Epithelioma usually starts in the skin of the lid at the border and then involves the remainder of the lid and extends into the orbit.

A small lesion can be destroyed by X-ray or radium. The larger ones demand radical extirpation followed by X-ray; may necessitate restoration of the lids by the Hughes technique.

Herpes Simplex Cornea: A superficial epithelial infection characterized by the development of minute epithelial opacities and fissures,

which may be followed by vesiculation and necrosis, the ultimate typical clinical picture being a dendritic ulcer. Despite aureomycin, tincture of iodine vigorously applied is still the best treatment.

Herpes Zoster: A unilateral herpetic eruption, confined to the forehead, eyelids and cheek, usually appears a few days to several weeks after the patient experiences a severe, prolonged pain behind the eyeball. Occurs usually in elderly, debilitated individuals. May or may not affect the cornea. Often mistaken by general practitioners for erysipelas.

Treatment: Quite unsatisfactory but aureomycin shows promise. If cornea is not involved, keep lids closed to protect it. Collodion applied in the early stage of eruption will give some comfort and may prevent deep scarring. Avoid ointments and washes. Pituitary extract by intramuscular injection may be valuable early in relieving the pain. Diphtheria antitoxin, typhoid inductotherm, X-ray therapy and vaccination all have their advocates. Nothing helps much but time.

Summary of Differential Points

Herpes Zoster Epidemicus	Herpes Simplex
(1) Follows distribution of the nerves affected.	May do so, but not necessarily.
(2) Always a preceding neuralgia.	No preceding neuralgia.
(3) Arises independently of any preceding disease.	Follows many infections which produce a lowering of tissue resistance.
(4) Attacks deeper layers, leaving permanent scarring.	Attacks only superficial layers; no permanent scarring.
(5) One attack seems to confer immunity.	Tendency to frequent recurrences.
(6) Duration 3 to 4 weeks, with long-continued diminution of sensibility.	Duration variable, often a few days; no impairment of sensibility.

Congenital Stenosis: A failure in formation of the lachrymal drainage apparatus, usually due to incomplete canalization of the lachrymal duct or liquefaction of the foramen in the nasal mucosa. Passage of small probes, 0 to 00, is usually sufficient to puncture the imperforate hymen or push the plug of inspissated material through the lachrymal duct. Massage of the sac is in itself frequently sufficient to produce patency.

Chronic Dacryocystitis: A painless enlargement of the lachrymal sac accompanied by epiphora and regurgitation of contents of mucocele into the conjunctival cul-de-sac. This should be differentiated from an ethmoid mucocele, usually by position of the swelling. As a rule nodular or cystic lesions appearing below the internal canthal ligament are due to infection or obstructions in the lachrymal sac; similar swellings occurring above the ligament are associated with chronic ethmoiditis.

Treatment: The only rational treatment for chronic dacryocystitis is some form of dacryocystorhinostomy. A few early cases respond to probing and iodized oil.

Acute Dacryocystitis: A chronic dacryocystitis on which has been superimposed an acute infection which gives rise to marked swelling,

redness and pain over the sac area. Pus, on pressure over the tear sac, may occasionally be expressed through the lachrymal punctum.

Treatment: Moist heat, incision and irrigation of the sac with a favorite antiseptic solution will result in prompt resolution. X-ray therapy may be applied for severe pain. As soon as acute symptoms have subsided a dacryorhinostomy should be performed to prevent recurrent attacks.

Malposition of the Lid Borders

Entropion: Two types, spastic and cicatricial:

1) The spastic variety is found most frequently in elderly people. It is associated with a chronic inflammation of the conjunctiva or a chronic dacryocystitis. It is usually restricted to the lower lid. The irritation of the conjunctiva is the cause of frequent blinking; while the overflow of tears causes frequent wiping toward the nose.

The treatment consists of the removal of the underlying causes. Instructions to wipe the tears from within outwards; a strip of stick adhesive plaster or collodion applied along the lid margin on to the cheek. When conservative measures fail, surgery is indicated. Zeigler's puncture is usually effective. If not, Wheeler's shortening of the orbicularis at the lower border of the tarsus is recommended. Alcohol injection of the outer third of the orbicularis is often effective. Crutch glasses.

2) Cicatricial entropion is due to the scarring of the conjunctiva following burns, trachoma, trauma, etc. Here if the conjunctiva has been unduly shrunken, a Webster operation with insertion of a mucous membrane graft from the lip is the simplest procedure and always gives satisfactory results.

Ectropion: Four types, spastic, paralytic, senile and cicatricial:

1) Spastic ectropion occurs in young persons with severe conjunctival inflammations associated with blepharospasm. Its relief is usually afforded by replacing the lids in the proper position and keeping them pressed to the eyeball with a bandage. If this fails, a Snellen stitch is indicated.

2) Paralytic ectropion is the result of paralysis of the orbicularis muscle. If after several months' time the paralysis has not disappeared, some operation such as Kuhnt Szymanowski is indicated. Plastic goggles may be worn during the exposure period to protect the cornea.

3) Senile ectropion is due to the relaxed orbicularis with a chronic catarrhal conjunctivitis. Here it will be found that the patient has been wiping the tears from within outward. The treatment is alleviation of the conjunctivitis with instruction to wipe the tears toward the nose. An operation similar to that for the paralytic type is effective when above measures fail.

4) Cicatricial ectropion is due to burns, ulcers, trauma, etc., where the skin has been destroyed with resultant scarring.

Where only small amounts of skin have been lost or where the scarring is slight, correction can be obtained by excision of the scar with closure of the wound. However, where there is extensive scarring, some form of blepharoplasty is needed, whether by pedunculated or sliding flaps, or by grafting must be decided to fit the individual case.

Symblepharon: An adhesion between the lids and conjunctiva. It is caused by burns (caustics or acids), trauma, operations, ulcers, etc. Their formation is prevented by daily passage of a glass rod between the two raw surfaces, by the suture of a piece of cellophane, rabbit peritoneum, fresh amnion or chromic allantoic membrane into the cul-de-sac.

Correction of an old symblepharon consists of cutting the adhesion and sewing in a piece of egg membrane, or, better still, a piece of cellophane between the raw surfaces. When the denuded area of the conjunctiva is large, it becomes necessary to shift the conjunctiva to cover the denuded area or insert a mucous membrane graft from the lip.

Diseases of the Palpebral Muscles

Ptosis: A paralysis of the superior levator palpebrarum muscle is indicated by a varying degree of the drooping of the lid. It is acquired or congenital. It may or may not be associated with paralysis of other muscles supplied by the oculomotor nerve. Congenital ptosis is often bilateral, frequently inherited, and the muscle itself is either poorly developed or absent.

If acquired, think of myasthenia gravis. Give diagnostic injection of 1 cc. prostigmine methyl sulphate, 1–2000 in office. If palpebral fissure widens, prescribe prostigmine bromide by mouth in sufficient amounts to maintain effect.

The treatment is essentially surgical and of the many operations advocated, but three principles underlie all: 1) Replacement of the levator by the occipitofrontalis. 2) Advancement of shortening, or both, of the levator. 3) The attachment of the superior rectus to the lid. Choice of operative procedure as enunciated by Kirby are: 1) Shorten levator if palpebral fissure is wider when patient looks up than when looking down. One millimeter of effect is obtained by removing one millimeter of tarsus or two millimeters of levator tendon. 2) Transplant portion of superior rectus to levator if palpebral fissure is narrower when looking up than when looking down. 3) Transplant strips of orbicularis to frontalis if all the normal elevators of globe and lid are paralyzed. 4) Guyton Friedenwald sling.

Blepharospasm: A spasm of the orbicularis. Usually a symptom of some other eye disease, but it may be a distinct disease in itself. Symptomatic blepharospasm is present in a varying degree in all in-

flammations of the conjunctiva and some inflammations of the eyeball. It is especially marked in phyletenular conjunctivitis. Blepharospasm is best relieved by instilling cocaine several times a day. Plunging the face in cold water several times a day will likewise break up the spasm.

Hysterical blepharospasm occasionally occurs in young persons of the female sex. In this condition both eyes close suddenly without apparent cause. Duration of this condition varies from hours to several months before the eyes open again. This spasm may be relieved by the instillation of cocaine or pressure on the so-called pressure spots if they can be found.

Senile blepharospasm is a form of spasm occurring in elderly people chiefly in the form of continual winking. It is usually associated with other nervous manifestations. Its treatment consists of treating the general nervous condition. The injection of 1 to 2 cc. of 80% alcohol into the outer third of the orbicularis has long been advocated. Benedict has recently reported excellent results by the injection of alcohol into the temporal branch of the facial nerve at the site of the O'Brien injection for akinesia.

Long continued blepharospasm and epiphora are frequently followed by blepharophimosis, an apparent contraction of the palpebral fissure at the external angle of the eye. It is produced by a vertical fold of skin—anterior to the canthus—produced by continued wetting of the skin with tears or with secretion.

Treatment: If removal of the cause does not cause a spontaneous cure, it may be removed by canthoplasty.

Blepharochalasis: Dystrophy of the skin in elderly people, due to relaxation; skin hangs down like a pouch over lid margin.

Treatment: Ablation of redundant skin, attaching lower border of skin incision to upper border of tarsus (Hotz).

Ankyloblepharon: Partial or complete adhesion of the upper to the lower lid. It occurs as a result of burns or ulcers.

Treatment consists of incision of the lid margins with suture thereafter, conjunctival to epithelial surfaces.

Lagophthalmus: Incomplete closure of the palpebral fissure upon attempted closure.

Causes: 1) Narrowing of the lids through loss of a portion of the skin of the lids as a result of burns, ulcerations, operations, trauma, etc. 2) Facial paralysis. 3) Patency of the lids under anesthesia, coma, or in patients seriously ill. 4) Exophthalmus.

The damage of the eyeball through insufficient coverage depends upon the extent of the lag.

Treatment: Protect the eye.

a) Bandage. b) Buller shield, watch glass, film, plastic goggles, etc. c) Contact glass. d) Median tarsorrhaphy. e) Correction of conditions

which prevent lid closure, viz: 1) narrowing of lids, by blepharoplasty; 2) exophthalmus by tarsorrhaphy and recession of levator palpebrum. —*Author's abstract.*

News Notes and Comments

American Optical Company announces the availability of two small Monoplex plastic eye units containing 120 and 240 eyes respectively, both rights and lefts, in the most required and adaptable shapes.

Designed for use by ophthalmologists, hospitals and eye clinics desiring to carry a minimum stock of artificial plastic eyes, the two units are described in a new brochure in which all of the 120 eyes in 20 basic colors are shown in full color. Copies of the brochure are available upon request to AO Branch offices.

The smaller unit consists of 120 AO Monoplex plastic eyes in the 20 colors proved by experience to be those most frequently used. They are furnished in both rights and lefts in the three most required shapes: large oval, medium standard, and large standard.

The larger set with 240 eyes contains the same 20 popular colors in the shapes of the smaller unit plus two additional shapes: the small three-cornered and the large three-cornered, for convenience in more quickly adapting the eyes to unusual sockets. In addition, there is a duplication of colors in the most essential shape.

Both cases are bound in gold tooled, Morocco grain hide, have snap button closings and removable mahogany trays lined with champagne-colored velvet. Special color assortments to meet individual requirements can be supplied.

The new brochure, as a prosthetic eye color chart, is the most accurate yet produced, according to the company, and is intended to be used as a guide in ordering Monoplex eyes. In addition to the full-color showing of the eyes, each of the five basic eye shapes is shown.

OTORHINOLARYNGOLOGY

Treatment of Epistaxis in Osler's Disease by Resection of the Septum. (*Behandlung des Nasenblutens bei Oslerscher Krankheit durch Septumresektion.*) *Erich Wirt, Heidelberg.* HNO Beih. Zschr. f. Hals- Nasen- u. Ohrenhlk. 1: 512–13, Heft 11, Nov. 1949.

A case of nasal hemorrhage is described in a man 72 years of age suffering from Osler's disease. He had suffered from nosebleed for 30 years, and his 2 brothers and 2 sisters had died of nasal hemorrhage. He did not have high blood pressure, and had been subjected to repeated nasal cauterizations to relieve hemorrhage. Examination

revealed the site of hemorrhage to be a ridge-like mucosal thickening in the left upper part of the septum above a moderately sharp kink in the septum. It was impossible to attempt cauterization as the hemorrhage was too severe. Only tight tamponade proved effective, but every time the tampon was removed the bleeding started afresh over a period of 3 weeks. A ligature of the afferent arteries could not be attempted owing to the complicated blood supply to the septum with its numerous anastomoses which would require ligature of several arteries. It is a well-known fact that even stubborn hemorrhage from the septal mucosa may cease following resection of the septum. This procedure was accomplished in the present case with extirpation of the varicose bleeding ridge, after which there was no more important hemorrhage. A slight bleeding from the turbinate could be controlled by caustics and cauterization. This measure is recommended also for hemorrhage from the septum due to other causes.

Carcinoma of the Craniopharyngeal Duct Simulating Epipharyngeal Tumor. (*Ueber ein als Epipharynxtumor imponierendes Hypophysengangscarcinom.*) *Ulrich Legler, Berlin.* HNO Beih. Zschr. Hals- Nasen- u. Ohrenhlk. 1: 517–18, Heft 11, Nov. 1949.

In the case of a woman of 61 years, who died of hemorrhage shortly following removal of a biopsy specimen for suspected epipharyngeal tumor, autopsy revealed severe emaciation, osteoporosis, atrophy of all the endocrines, and advanced premature senility as in Simmonds' pituitary cachexia. A carcinoma of the craniopharyngeal duct in its extension toward the brain, had destroyed the entire anterior lobe of the pituitary gland, producing the clinical picture of Simmonds' cachexia. In its extension in the direction of the nasopharyngeal space, the tumor had displaced the epipharynx, thus giving the impression of an epipharyngeal tumor. The fatal hemorrhage proceeded from the anterior art. communicans of the circle of Willis, which had been eroded by the tumor. Had a bitemporal roentgenogram been taken in this case, it would in all probability have disclosed the extensive destructions of the sella turcica and sphenoid, which would have led to greater caution in attempting ligature of the arteries. In epipharyngeal tumors, occipital roentgenograms usually suffice, since these tumors do not, as a rule, extend into the sella turcica. The visual defects so common in patients with pituitary tumors were not present in this case. The close ontogenetic relationship between the epipharynx and the craniopharyngeal duct is stressed. Epipharyngeal carcinoma does not extend upward but laterally. In the present case, the tumor of the craniopharyngeal duct evidently extended both toward the pituitary and toward the pharynx.

Scleroma Simulating Atrophic Rhinitis. Clinical Differentiations and Laboratory Confirmation. *Manuel R. Wexler, Los Angeles, Calif.* Laryngoscope. 59: 1026–1029, Sept. 1949.

That scleroma (rhinoscleroma) in its early stage may resemble atrophic rhinitis occurred to us while treating three active cases of scleroma. Both conditions present a foul odorous purulent discharge and extensive crusting in the nose. However, in scleroma, upon removed of the crusts and discharge, the mucosa is reddened and firm; the nares instead of being wide are narrowed, and the tissues firm to palpation. This is the essential clinical finding. The final diagnosis is based on pathological and bacteriological findings and if available, complement fixation reaction.

All cases of atrophic rhinitis were studied as possible early cases of scleroma. From January 1946 to January 1948, twenty-seven cases of atrophic rhinitis were examined and routine smear and biopsy for scleroma were done on all cases, including three cases of atrophic rhinitis following extensive nasal surgery. The diagnosis of scleroma was considered positive when the pathological report and the culture were both positive. Seven cases met these criteria.

The organism, *K. Rhinoscleromotis*, or bacillus of Von Frisch, thought to be responsible for the disease, is sensitive to streptomycin, and encouraging results have been obtained in treatment of scleroma with this drug. 6 references.—*Author's abstract.*

A Phylogenetic Concept of Allergy. *Henry L. Williams, Rochester, Minn.* Proc. Staff Meet. Mayo Clin. 24: 516–24, Sept. 28, 1949.

Von Pirquet's hypothesis of allergy formed from his own work and that of Ehrlich, Arthus and Breton was evolved for the purpose of explaining certain observed clinical phenomena. When it was found that clinical allergy in many cases did not meet the criterion of demonstrable circulating antibodies established by the hypothesis, instead of admitting that the fundamental assumption was incorrect, and either abandoning or correcting the hypothesis, immunologists and allergists decided to restrict the term "allergy" to those instances of the clinical phenomenon of allergy in which an antigen-antibody type of reaction could be demonstrated. It would appear, however, that the term "allergy" was originally coined to describe the clinical phenomenon and not the hypothesis. When, however, the majority of allergies failed to meet the criterion of circulating antibodies established by the hypothesis, instead of entertaining the possibility that there might be some defect in this fundamental assumption, many immunologists insisted that only that small portion of those indistinguishable clinical phenomena in which circulating antibodies could be detected could rightfully be called "allergy." Some allergists, particulary Duke, were not satisfied with this viewpoint.

It is felt that by research of the literature on the body's method of

resistance to changes in the external and internal environment and by considering the development of a resistance mechanism through phylogeny, a broader and more physiologic concept, interdigitating better with the observed facts, could be suggested.

It would seem reasonable, therefore, to speak of three related but not identical types of allergy: 1) physical allergy (reflex type); 2) bacterial or tissue allergy and 3) humoral allergy.

In physical allergy (reflex type) no antigen-antibody type of reaction occurs. Vasospasm and anoxia result in vascular injury, increased capillary permeability, release of histamine and the production of the typical allergic wheal. It is phylogenetically the most primitive type of allergy and can be considered an overaction of the "alarm reaction" described by Selye.

In bacterial or tissue allergy the primitive vascular reaction is retained but cell injury also may be produced by an antigen-antibody type of mechanism retained in the tissue cells. There are no freely circulating antibodies in the blood stream. The normal physiologic prototype of which this type of allergy could be considered the hyperfunction is granulomatous inflammation.

In humoral allergy, retaining the primitive reaction, an antigen-antibody reaction in the cells is also retained, but in addition circulating antibodies, probably from the lymphocyte, are present in the blood serum. Suppurative inflammation could be considered the normal prototype of which humoral allergy is a hyperfunction.

There is nothing in this new concept of allergy to suggest that these three types of allergy are mutually exclusive.

The proposed phylogenetic concept presents allergy as a gradual growth in the animal organism of an increasingly more elaborate defense mechanism, new developments being added to the primitive mechanism rather than replacing it; all types of allergy, therefore, consist of hyperfunction of this stereotyped defense mechanism.—*Author's abstract.*

Plastic Surgery. Four Case Reports. *Samuel Seltz, Cincinnati, Ohio.* Ohio State M. J. 45: 873-874, Sept. 1949.

The importance of thorough excision of malignancies of the nose and face is stressed, with a period of six months to a year between excision and restoration by plastic surgery. Crushing injuries of the nose, due to auto accidents, are common and should be corrected immediately if possible. Frequently later plastic procedures are necessary.

Congenital deformities of the nose and ears, such as long hump noses or lop ears, frequently produce feelings of inferiority in these patients and should be corrected by surgery.

Four cases are illustrated, showing: 1) total nasal reconstruction following excision for carcinoma. 2) congenital long, hump nose,

3) Saddle nose following auto accident, corrected by cartilage implant. 4) Lop or outstanding ears corrected surgically. 2 references. 4 figures.—*Author's abstract.*

Use of Radium in Treatment of Hypertrophic Lymphoid Tissue in the Nasopharynx. *Charles H. Dow, Monessen, Pa.* Arch. Otolaryng. 50: 417–428, Oct. 1949.

Though all visible and palpable areas of adenoid tissue are surgically removed, there may remain in the mucous membrane seeds of lymphoid tissue which may increase in size leading to deafness, chronic pharyngitis, chronic postnasal discharge or otorrhea.

Anatomically, the recurrent lymphoid masses may occur: 1) centrally, in the midline of the pharyngeal vault; or 2) laterally, a) about the torus tubarius and within the eustachian tube, b) in Rosenmuller's fossa, c) as lateral pharyngeal bands and d) as granular pharyngitis. Fricke and Pastore divided the lateral pharyngeal bands into three types: 1) fine granular bands, evident only when inflamed, 2) coarse, raised granular bands with very few crypts, and 3) hypertrophic tonsillar bands which are cryptic, resembling the palatine tonsils, but behind the posterior pillar of the fauces.

Clinically, one can detect recurrent lymphoid tissue by inspection of the oropharynx and nasopharynx with a postnasal mirror and electric nasopharyngoscope. Occasionally, palpation or a roentgenogram may be helpful. An otoscopic examination may reveal a retracted or perforated ear drum.

Therapeutic indications for radium treatment include: impaired hearing, aerotitis media, aural stuffiness, otorrhea, recurrent pharyngitis and certain cases of asthma. These conditions must be associated with demonstrable lymphoid tissue in the nasopharynx for the radium treatment to be effective.

During the year February 1, 1947, to February 1, 1948, seventy-four patients at the Gill Memorial Eye, Ear and Throat Hospital, Roanoke, Va., were given radium treatments for recurrent lymphoid tissue in the nasopharynx. Forty-one patients in this group were treated by placing the Army type monel metal applicator containing 50 mg. radium sulphate eight and one-half minutes to each side of the nasopharynx. Thirty-three patients in the group were treated by placing the same applicator to each side of the nasopharynx for twelve minutes. A comparison of the two series of treatments showed that the longer twelve-minute treatment removed lymphoid tissue safely and more effectively. 2 tables.—*Author's abstract.*

Ligature of the Arteria Carotis Communis and Interna. (*Ueber die Unterbindung der Arteria carotis communis und interna*). *Karl Wüst,*

Mainz. HNO Beih. Zschr. Hals- Nasen- u. Ohrenhlk. 1: 453–55, Heft. 10, Aug. 1949.

A dangerous complication of ligature of the external carotid is progressive thrombosis from the site of ligature in the direction of the interna. This can be avoided by placing the ligature above the superior thyroidea, and thus preventing stagnation of the circulation central to the site of the ligature. Occasionally, following ligature of the external carotid artery there may develop a pathologic reflex irritability of the carotid sinus, so that even slight pressure on the scar may give rise to attacks of malaise, vertigo and sweats.

In a series of 40 ligatures of the common and internal carotid arteries certain unusual observations were made. According to the literature the mortality rate in these cases ranges from 10 to 70%. In the present series the death rate was about 20%, but most of these patients were soldiers and therefore under 40 years of age. The results indicate that ligature of the internal carotid is more dangerous than ligature of the common carotid. Some studies published by Rein et al. indicate that following ligature of the left common carotid artery, the circulation in the opposite internal carotid is increased 70 to 100%, whereas ligature of the internal carotid on the left side will cause an increase in circulation in the right internal carotid in only 6 to 10%. This phenomenon which is known as the meningeal reflex occurs also following ligature of the external carotid artery, but only if the meningeal artery has been excluded by the ligature. This increase in circulation of 100% on the opposite side following ligature of the common carotid, would explain the lesser danger of ligating this artery.

In injuries of the common or internal carotid artery, ligature must be performed at the site of injury and not below it, in order to avoid reflux hemorrhage from the Circle of Willis. This retrograde circulation may explain the greater tolerance for ligature of the common carotid artery.

Following fatal ligatures of the internal carotid, autopsy often reveals an ascending thrombosis which occurs about 10 days after ligature. It is considered a most dangerous complication. Such an ascending thrombosis may also develop following ligature of the common carotid artery. Small thrombi breaking off near the site of the ligature can be transported only to the bifurcation of the internal carotid where they cause no damage. To diminish the danger of ligature of the internal carotid, it is suggested that a simultaneous ligature be placed on the external carotid artery in order to elicit the desirable meningeal reflex. The slow compression of the common or internal carotid with strips of fascia greatly diminishes the dangers incurred, but the author has had no experience in this method. Repeated simultane-

ous ligature of the internal jugular vein has also yielded some successful results. 4 references.

A Method for Improvement of the Curved Nasal Tip. *J. Eastman Sheehan and Wilson A. Swanker, New York, N. Y.* Laryngoscope 59: 680–83, June 1949.

The extreme point of the nose may remain too rounded and flat at the end of the usual rhinoplastic operation. A simple method for correcting this defect is described. An approximately rhomboid shaped piece of cartilage 12 mm. in each dimension is taken from the resected alar cartilage or cadaveric cartilage. Either is satisfactory. Pieces may be laminated and fastened together with a plain catgut suture if not sufficiently thick. The skin from the tip of the nose is freed along the inner and outer horns of the lower alar cartilages and the columella then sutured to the septum by the so-called orthopedic stitch. The small rhomboid of cartilage is then inserted beneath the skin at the extreme nasal tip with its longitudinal axis corresponding to that of the nose and resting at the extreme upper part of the columella. It is secured in position by a mattress suture through the upper part of the columella. If the rhomboid does not seem secure, a fine nonabsorbable suture may be passed through it and then, by a needle affixed to each end, through the skin of the nasal tip so that it is firmly secured as desired. A pleasing retrousse effect may be obtained by immobilizing the rhomboid by a narrow adhesive strip below the extreme point of the cartilage and another above the rhomboid. This procedure lengthens the columella, more definitely defines the nasal tip and gives the borders of the nares a more graceful curve. 3 figures.

Tumors of the Nasopharynx. *Harry C. Rosenberger, St. Luke's Hospital, Cleveland, Ohio.* Ohio M. J. 45: 878–82, Sept. 1949.

Statistics of nasopharyngeal tumors are unreliable because of the somewhat indefinite area indicated by the term nasopharynx. Review of the records of St. Luke's Hospital showed only 13 cases of neoplasm of the nasopharynx proper in a total of 137,529 patients. Seven were malignant. The most common benign neoplasm of this area is fibroma, the juvenile type of which is frequently quite difficult to diagnose. It usually develops in the periosteum of the posterior osseous wall of the nasopharynx as a hard tumor with a somewhat sessile attachment. It tends to erode adjacent tissues and cause serious hemorrhage or even meningitis. Other symptoms are swollen cervical glands, nasal blockage, diminished hearing and stuffiness in the ear, face and ear pain, bloody postnasal discharge, mental dullness and an adenoid countenance. Pain and dysphagia may develop if the tumor becomes sufficiently large. These tumors may spontaneously regress after some

years but this does not occur with sufficient frequency to warrant non-treatment. Surgery is commonly necessary as roentgen and radium irradiation do not usually cause it to disappear. Preliminary irradiation however may facilitate surgical removal by decreasing the size and vascularity of the tumor. Electro-coagulation helps to control bleeding and to destroy inaccessible tumor extensions. Other benign nasopharyngeal neoplasms are hemangioma, neurofibroma, lipoma, chondroma, dermoid, chordoma, teratoma and mixed, cystic and polypoid tumors. Hemangiomas can usually be removed by irradiation but neurofibroma and mixed tumors require surgery.

The nasopharynx contains many types of epithelium and therefore a wide variety of malignant growths. Nasopharyngeal cancer forms about 2% of all malignancies of the head and neck and about 80% of cases are men. The condition is frequently diagnosed too late or erroneously, about 32% of cases receiving unnecessary surgery because of incorrect diagnosis. The symptoms of this condition are well known but the occurrence of early metastatic and nerve pressure symptoms are emphasized. Metastases occur early, first on one and then both sides. Intracranial or extracranial involvement of any of the cranial nerves may occur. Unilateral choked disc rather indicates extracranial involvement. The orbit is invaded through the supraorbital fissure in about 4% of cases with consequent eye symptoms ranging up to blindness.

Treatment of nasopharyngeal malignancy is chiefly irradiation as these tumors are surgically inaccessible and especially radiosensitive. Surgical removal of cervical metastases seems useless. Cures have been reported following application of the actual cautery to the primary growth followed by any necessary plastic repair. The importance of a routine but adequate nasopharyngeal examination is emphasized. 8 references.

Retothelial Sarcoma and Plaut-Vincent's Angina. (*Retotheliosarkom und Plaut-Vincentsche Angina.*) *Otto Leise, Bremen.* HNO, Beiheft z. Hals- Nasen- u. Ohrenhlk. 1: 456-59, Heft 10, Aug. 1949.

Retotheliosarcoma is of special interest to otorhinolaryngologists because it appears most frequently in the cervical region. The histologic aspects are most varied and clinically the tumor often simulates inflammatory conditions and systemic diseases of the lymphatic apparatus. It may develop under the deceptive form of a prolonged chronic, apparently inflammatory swelling of nonspecific type and is not infrequently bilateral. The latter has suggested a possible central or neurological origin. Occasionally the tumor is seen in association with non-specific tonsillitis so that diagnosis is rendered difficult or impossible. The symptoms may include febrile angina, edema of the

uvula and soft palate, tonsillar and peritonsillar swelling with exudate, a painful glandular swelling and marked general malaise. According to Kindler, there exists a definite relationship between tumor formation and general inflammatory disease of the tonsils. Possibly a latent tumor might thus be stimulated to growth. Further study of this relationship is urged.

A presumably unique case is reported in a man of 23 years presenting the bacteriologic findings and histologic evidence of Plaut-Vincent's disease with a chronic non-specific tonsillitis suggesting tumor. The swelling persisting over a period of months had forced the tumor tissue into the background. Histologic examination of the removed tonsils had been neglected. The very slight and late development of cellular growth could not be explained although ulceration had persisted for months. The glandular involvement was very slight, in contradistinction to some cases, in which the glandular swelling appears as a large tumor. Neither biopsy nor tonsillectomy caused any marked acceleration of tumor growth as noted in some cases. It was concluded that in the present case the inflammation had exerted no effect on tumor growth. It is suggested that hyperemia and neoformation of capillaries may lead to cell proliferation and tumor formation. The trophically destroyed marginal zone showed necrosis and ulceration. It was here that the spirilla and fusiform bacilli proliferated, thus producing the independent picture of Plaut-Vincent's angina. Since this tumor may develop in areas of swelling, it may be almost impossible to discover the nucleus. Diagnosis is possible only by persistent clinical analysis even in opposition to histologic findings. The bacteriologic diagnosis of Plaut-Vincent's disease only confused diagnosis in the present case. It should be kept in mind that bacteriologic findings may be misleading. Following tonsillectomy, there was a gradual recurrence in the right cervical region with general malaise. A thick wedge of tumor tissue was discovered at the lower margin of the tonsillectomy, extending to the base of the tongue. Histologic examination revealed retotheliosarcoma. Reexamination of tissue taken at the previous tonsillectomy showed areas suggesting this tumor. The tumor disappeared completely following roentgenotherapy and there was no recurrence or metastasis. 6 references.

A Simple Radiological Aid to Gasserian Injection. *John Penman, St. George's Hospital, London, England.* Lancet, 2: 268–74, Aug. 13, 1949.

Radiology is not used to guide the needle to the foramen ovale in making gasserian injections as this can be readily accomplished without it by experienced operators using reasonable care. It is valuable, however, in helping to insert the needle in the most central part of the

gasserian ganglion and thereby obtaining the best results. A new practical method of injection based upon geometrical and radiological principles is described in detail. Preliminary films of the skull are studied for possible bony abnormalities, the patient seated in a high-backed chair, Harris's modified guide lines drawn and the needle inserted. The patient is seated on a stool by the roentgen apparatus when the needle point appears to be in the foramen ovale or five minutes after the skin puncture, whichever is first, and a basal and an oblique film exposed. The apparatus must be of the Lysholm-Schonander type for the best results. The basal view shows the obvious and direct bearing of the needle point. The relation of the needle depth as measured on the film to the true depth is usually as 4 to 5. The oblique view shows the silhouette of the foramen ovale and enables the needle elevation to be directly seen regardless of depth. Combining the data obtained from these 2 films gives the depth, bearing and elevation of the needle point. The depth is somewhat less accurate than the bearing and elevation but these are probably accurate within 1 mm. The oblique view also shows the petrous-needle angle. The needle position can then be adjusted as necessary or a second needle correctly introduced beside it, the accurately known position of the first needle being a valuable guide to the second. Ten or fifteen minutes' time is usually sufficient for positioning, both exposures, development and interpretation. The most difficult case rarely requires over 3 or 4 films.

The success of trigeminal injections is judged by repeated tests of sensory function made by the same observer at regular intervals. Successful injection in this study was analgesia or increased sensory loss to pinpricks in all areas where pain had been previously felt. Patients were examined two days to eight weeks after injection and results described as success or failure. The patient's idea of successful injection is based upon whether or not and when, further radical treatment may be necessary. Two day success rates by separate tens of injections in 135 patients showed 50% success without radiological aid and 80.7% with radiology. Regardless of statistics, the use of radiology enables injections to be made with precision and confidence and permits ample reassurance of the patient. While these studies showed that much better results are obtained by injections made with the aid of radiology, the traditional skill and care necessary without it are still required. 31 references. 4 tables. 8 figures.

The Treatment of Maxillofacial Fractures. *Merrill W. Michels, Oakland, Calif.* Permanente Found. M. Bull. 7: 79-889, July 1949.

The basic principles in obtaining fine scars are of prime importance; adherence must be to right angle incisions, tension lines, adequate relaxation of skin edges, their support, fine external sutures and their

early removal. Cutting debridement or open packing of facial wounds is never indicated. Traumatic tattoo can be treated by Iverson's sandpapering method. Concomitant injuries, e.g., of the brain, may take precedence but do not justify prolongation of definitive management. Adequate clinical and roentgen examinations are vital.

Reduction should not wait for subsidence of swelling except in the case of nasal fractures. With these the fragments will retain position when reduced unless comminuted since there is no muscle displacement. The vascularity stimulates rapid union and manipulation should be done in the pre-edematous stage or after subsidence of swelling; overcorrection is then required. Lateral nasal deviations may be manually pushed to midline and splinted externally. Depressed fractures can be elevated with any blunt instrument, straightening out fresh septal deviations. Endonasal splints of dental base plate wax are helpful with extensive comminution; external compression is required. Dorsal height can be maintained by wire sutures through the base of the nasal bony arch.

Fractures of the upper jaw without displacement require no fixation except temporary stabilization. In unilateral transverse fractures immobilization utilizes the sound side securing it with a dental arch band. The entire fragment of the complete transverse fracture of the maxilla can be fixed by a dental cap-type splint or preferably by wire sutures anchored to the upper first molars through the cheeks to extension arms of a plaster head cap. Injuries about the bony orbit carry with them threat to the globe. Depressed fractures of the orbital floor are frequently overlooked due to the masking effect of lid edema resulting in muscle imbalance and vertical diplopia. Compound fractures involving the malar compound require splinting to maintain comminuted fragments; the canine fossa route with antral packing is satisfactory. Fractures of orbital rim and malar process can be directly reduced by a heavy towel clip or dental forceps. Fractures of the zygomatic arch can be reduced by the methods of Matas or Gillies.

The mandible suffers more fractures than any other facial bone except the nose. Roentgen studies of the temporomandibular region are essential. Sites of frequency are the condylar neck, posterior to the mental foramen, at the junction of the ramus and the body and at the symphysis. The simplest and safest method of treatment with a good complement of teeth is by intermaxillary fixation (Winter traction splint). Changes in directional force and pull are possible by simple rearrangement of elastic bands. The control of edentulous fragments constitutes a serious problem. The extra-oral method of fixation (Roger Anderson skeletal reduction) or internal wire fixation utilizing Kirschner wires, provides simple and direct methods of fixation. Direct bone wiring by open reduction presents hazards and is generally avoided but does have a place in displaced fractures of the angle or symphysis. Circumferential wiring is used chiefly with the edentulous

mandible. A certain number will have loss of bone substance and require bone grafts. Iliac bone grafts of pure cancellous bone are satisfactory.

In conclusion maxillofacial injuries are commonplace. This series reviews the experience with approximately 150 nasal fractures and 80 maxillofacial fractures. Proper evaluation and early repair are necessary for adequate cosmetic and functional results. An understanding of principles rather than elaborate devices is required. 10 references. 5 figures. 2 tables.—*Author's abstract.*

Rhinology in Children, Resume of and Comments on the Literature for 1948. *D. E. S. Wishart, Toronto, Canada.* Laryngoscope. 59: 929-59, Sept. 1949.

The common cold is probably of virus origin so that the prophylactic use of sulfadiazine is unjustified. It is recommended that oral penicillin be given in water and on an empty stomach for adequate absorption. The use of A and B types of influenza vaccines has materially reduced the incidence of influenza. The nasopharynx has been found to be an important entry-point for the cold virus. Vitamins, nasal drops and anti-bacterial drugs are but slightly effective prophylactically but the otolaryngologist can do a great deal to prevent colds and the recurrence of pyogenic complications by removing or changing hyperplastic or chronically infected nasopharyngeal lymphoid nodules by surgery, irradiation or both. Immediate external drainage plus antibiotics has given excellent results and makes intranasal instrumentation unnecessary. Routine examinations of specimens from cases of chronic nasal discharge will often reveal *Corynebacterium diphtheriae* and permit virulence tests and early chemotherapeutic treatment.

Many allergic conditions are found in otolaryngology. Eosinophilia is believed by some to be part of the defense mechanism but allergic eosinophilia is extremely variable. Cooperation between the allergist and rhinologist is important in the treatment of nasopharyngeal allergic conditions. Local nasal pathologic changes and mechanical obstructions require surgical correction but treatment should be conservative at first. Nasal roentgen therapy is of doubtful efficacy and ionization is harmful. Anthisan in doses of 0.6 gr. daily has been quite effective in hay fever and vasomotor rhinitis and prolonged use has not damaged the nasal mucosa.

The question of tonsillectomy should be cautiously approached and tonsils and adenoids should only be removed in properly selected cases. Tonsil tags are more dangerous points of infection than whole tonsils. Enlarged adenoids cause trouble more frequently than enlarged tonsils because they obstruct nasal breathing. Tonsils should only be removed for recurrent attacks of tonsillitis with persistent glandular enlargement in the neck and not merely for enlargement or because they con-

tain purulent-looking material. Adenoids should be removed, however, for slight nasal obstruction, deafness or earache. Nasal breathing should be reestablished after adenoidectomy by deep breathing exercises through the nose or the condition will recur. The use of chewing gum tablets containing aspirin after tonsillectomy has not been followed by any specific variation of the prothrombin time but late secondary hemorrhage has occurred in some 10% of cases. The simultaneous administration of vitamin K has prevented salicylate-induced hypoprothrombinemia but the high incidence of secondary tonsillar hemorrhages in these patients is believed to result from some local wound effect. It is concluded that aspirin chewing gum should not be used postoperatively after tonsillectomy. Results of extensive study indicate that, while tonsils should not be indiscriminately removed during a poliomyelitis epidemic, tonsillectomy does not appear to predispose a patient to poliomyelitis.

Fracture is frequent in nasal injuries of children. Early reduction is advisable but hemorrhage and edema may cause delay. Fractures are maintained in position after reduction by internal packing with petrolatum gauze and dental moulding compound externally. Children stand early rhinoplastic procedures well. 48 references.

The Use of a Mixture of Penicillin, Succinyl-Sulfamide and Urea for Local Application in Oto-Rhino-Laryngology. (*L'emploi en oto-rhino-laryngologie du melange pénicilline-succinyl-sulfamide urée en applications locale.*) *H. Plisnier, University of Brussels, Belgium.* Bruxelles-méd. 30: 358-61, Feb. 12, 1950.

A mixture of penicillin 200,000 units and succinyl sulfamide 90 Gm. urea 10 Gm. has been found to be much more stable when kept in ampules than a mixture of penicillin and succinyl sulfamide without the urea. This mixture has been used in the form of a powder or a paste in various surgical operations. Amounts varying from 2 to 5 Gm. are employed according to size of the operative cavity. The operations in which this mixture has been used include radical mastoidectomy, operations for frontal sinusitis and maxillary sinustis, goiter operations, removal of the submaxillary gland, laryngectomy (1 total and 1 partial) and Lempert's operation. In sinus operations the powder was usually used, and as a rule no postoperative lavage was necessary. In the mastoid operation, lavage was done in some cases, but less frequently than before; after each treatment (every four or five days), the powder was applied in the depth of the tympanic cavity. No formation of crusts was observed. In most of the cases in which this mixture was used, the wound healed well and rapidly, and the duration of postoperative hospitalization was diminished. No toxic effects were observed except that in 3 cases (in a total of 59 cases) in which operation was done on the

ear, there was a local eruption in the external auditory canal and on the auricle. This was found to be due to the sulfonamide and not to either the penicillin or the urea. Such reactions do occur with various sulfonamides, but are not serious and disappear promptly when the drug is discontinued.

Parotitis in Parinaud's Conjunctivoglandular Syndrome. (*La parotidite dans le syndrome conjonctivoganglionnaire de Parinaud.*) H. Koumrouyan, Berne. Schweiz med. Wschr. 79: 1045–47, Nov. 5, 1949.

Although Parinaud mentioned a swelling in the parotid region in the original article on the syndrome which bears his name, the presence of parotitis has never since been mentioned in classic treatises on the disease. In the past year this complication has been observed in two cases in which the parotitis was homolateral with the syndrome. Both occurred in young girls, 10 and 11 years of age respectively. No etiological organisms or clinical or serologic signs of syphilis, tuberculosis, mycosis, or tularemia could be demonstrated. There were multiple satellite preauricular and cervical glandular lesions but these were painless and showed no tendency toward suppuration. The presence in these two cases of unilateral-homolateral diffuse parotitis, resembling virus sialadenitis, suggested that it might be more correct to use the name "Parinaud's conjunctivoganglioparotid triad" for this syndrome. The parotid involvement occurred early in the first case, contemporary and even prior to involvement of the preauricular glands. In the second case, the parotitis followed the adenopathy. The course was rapid and benign with no macroscopic changes noted in the saliva. It seems probable that the syndrome is caused by a virus. 24 references. 2 figures.

In the United States parotitis as a complication of Parinaud's oculoglandular syndrome is almost unknown. Most cases in this country are of the Verhoeff type with a leptothrix demonstrable in biopsy material. The virus of lymphogranuloma venereum has been the only viral agent of importance and parotitis is not a feature of lymphogranuloma venereum conjunctivitis.—Editor.

Minor Salivary Gland Tumors in Respiratory Tract and Ear. Review of the Literature and Report of Two Cases. *Harold Owens, Los Angeles, Cal.* Laryngoscope, 59: 960–83, Sept. 1949.

Review of the literature shows only 1,138 cases of minor salivary gland tumors reported during the past twenty years but the evidence indicates that they occur more frequently than has been assumed. Their origin is chiefly or entirely from epithelial tissue. Both their histological classification and their division into benign and malignant

neoplasms have been unsatisfactory because of their marked histological variations. The more characteristic patterns are mixed tumors, cylindromas and mucoepidermoid tumors. Their histopathology is described. Benign mucoepidermoid tumors usually show a marked multiplicity of cell types and simulate renal adenocarcinoma in about one-third the cases. Malignant mucoepidermoid tumors are usually diffusely overgrown, rather anaplastic, and exhibit a predominance of epidermoid cells. Clinically, they show slow growth and differences in consistency depending upon their connective tissue and cartilage content. They usually begin as a small submucous nodule and grow within a capsule. The malignant type is commonly smaller than the benign and shows less tendency toward cyst formation. Localized pain, swelling and tenderness are present to a varying extent. Tumors of the palate may cause hemorrhage or difficult deglutition; those of the tongue, impaired speech; and tumors of the paranasal sinuses produce nasal blockage, pain and nasal bleeding or discharge. Impaired hearing and demonstrable bony changes may follow tumors in the external auditory canal or middle ear. Malignant tumors often produce mucosal ulceration and erosion or penetration of adjacent bony structures. Either the hard or soft palate is the most common site of the primary lesion. The nasal cavity is the next most frequent location. Only 7 cases of minor salivary gland tumors of the bronchi have been reported.

The first patient was a 60-year-old man who had sore throat and pain radiating to the right side of the face for two days. He had been a pipe smoker for forty-three years. Examination showed leucoplacic areas in the mucosa of the cheeks, soft and hard palate, and a firm, nontender, submucosal nodule on the left side of the soft palate. When removed, the tumor was found to involve the entire left side of the soft palate, extending anteriorly to the junction of the hard and soft palate. The wound healed by first intention and there have been no indications of recurrence. Histological examination showed a predominant adenomatous structure. The second patient was a 43-year-old woman who had had sore throat for two years and intermittent hoarseness for twelve months. Mirror laryngeal examination showed 2 large polypoid granular masses in the posterior portion of the larynx beneath the left vocal cord. Histologic examination after removal showed a benign tumor capable of local recurrence and aggressive growth. A third case briefly reviewed was diagnosed as a mixed salivary gland tumor but proved at autopsy to have been a metastasis from a hypernephroma. 30 references. 8 figures.

The Relationship of Chronic Recurrent Sialadenitis to the Alarm Reaction. *Hyman E. Bass and Milton Mendlowitz, New York, N. Y.* Ann. Otol. Rhin. & Laryng. 58: 868–71, Sept. 1949.

Recurrent sialadenitis may occur at any age and has a benign course. Many cases have been described in children, in whom there were associated allergic manifestations. Other cases have been reported in adults, frequently with sialodochectasis. The present report describes two cases of recurrent parotitis in emotionally unstable individuals who were subjected to severe social and environmental stress. Recent experimental work has shown that the parotid glands participate in the "alarm reaction" of Selye. It is postulated that these cases may represent manifestations of the "alarm reaction." 13 references.—*Author's abstract.*

Acute Pharyngeal Tonsillitis and Sequelae. (*Akute Tonsillitis pharyngea und Folgezustände.*) *Alfred Manz.* Zschr. Kinderh. 67: 244-60, Heft 2, 1949.

In 4 of 5 cases of acute pharyngeal tonsillitis, the condition was definitely diagnosed as the primary infection. In all of these cases the infection spread to other organs and tissues by way of the lymphatics, the blood stream or by contiguity. This affection has therefore a great significance in a great variety of diseases, and most especially in children. The pharyngeal tonsil may serve as a port of entry for the organisms of epidemic encephalitis, otitis media, sinusitis, arthritis, endocarditis, pleurisy, pneumonia, nephritis and general sepsis. A high retropharyngeal abscess may lead to sepsis. Rhinitis, bronchitis and enteritis have been known to follow pharyngeal tonsillitis, not to mention endocarditis, pericarditis, coecal rheumatism, and postinfectious glomerulonephritis. Fatal sepsis is more frequent following palatine tonsillitis since the bony bed of the pharyngeal tonsil permits more rapid retrogression of the process. The present series of infection following pharyngeal tonsillitis included: 1) a case of enteritis; 2) a purulent retropharyngeal phlegmon followed by purulent mediastinitis, pleurisy and death; 3) a bilateral maxillary empyema with retropharyngeal phlegmon, purulent mediastinitis, pleurisy and death; 4) infection of the pharyngeal tympanic tubes on both sides with initial bilateral otitis media healing by spontaneous perforation, with death due to general infection, and 5) a case illustrating the path of infection from the pharyngeal tonsil to the tubal mucosa and suggesting an intracanalicular extension. 33 references. 8 figures. 1 table.

Oral And Pharyngeal Moniliasis. Report of Ten Cases. *Vincent J. Kelley, Boston, Mass.* Ann. Otol. Rhin. & Laryng. 58: 883-891, Sept. 1949.

Histories of oral and pharyngeal inflammation in adults are presented, with *Monilia albicans* isolated as the only or the predominant organism. There was frequent association with the condition called

black or hairy tongue. On the basis of the common causative agent and the uniformly successful therapy, there may be justification for considering these furry patches of all hues between white and black, as belonging to the same clinical entity. Therapy was conducted with local applications of gentian violet combined with large doses of vitamin B-complex by mouth; this was continued from one to ten months with an average of three and a half months. Hitherto, *M. albicans* has been considered as causing only white areas. Should the observations presented here be confirmed by further studies, it may be considered that *M. albicans* is a predominant organism in black or hairy tongue patches as well. 19 references. 2 figures.—*Author's abstract.*

Proboscis Lateralis: A Rare Malformation of the Nose—Its Genesis and Treatment. *J. J. Biber, London, England.* J. Laryng. & Otol. 63: 734–41, Dec. 1949.

After reviewing the few cases of this rare malformation reported in the literature the author sets out to discuss first the essential characteristics of it: the formation of a trunk-like appendage invariably suspended from the upper and inner wall of the orbital roof, a soft and elastic trunk, club-shaped at its distal end, with a small opening, an outlet of a canal running along the whole axis of the trunk. Proximally the duct has a blind ending and shows no connection with the more or less developed nasal cavity. The covering skin has sebaceous glands. The connective tissue beneath it contains striated muscle fibres and cartilaginous elements corresponding to the normal cartilage of the lateral nasal wall. The central canal is lined with a stratified columnar epithelium. Sometimes elements of other tissues are also found, corresponding to the normal structures of the lateral wall of the nose.

A number of diagrams elucidate the discussion of the genesis of this malformation, which leads to the conclusion that this is due to injuries in fetal life (amniotic cords?), acting on the lateral nasal process. The extent of the deformity depends on the time of the onset of this cause. The surgical repair of this malformation in otherwise normally developed children should be performed by making use of the tissues in a two-staged plastic operation, details of which are given. The time of the plastic operation should be chosen as late as possible; preferably at the time when the growth of the nasal skeleton is completed. 15 references. 4 figures.—*Author's abstract.*

The Treatment of Cardiospasm. (*Ueber die Behandlung des Kardiospasmus.*) *Willm Wagemann, Kiel.* HNO, Beihefte z. Zschr. Hals- Nasen- u. Ohrenhlk. 1: 446–50, Heft 10, Aug. 1949.

Medical treatment of cardiospasm is rarely successful. Among the drugs used for this purpose may be mentioned eupaverin, eumydrin, atropine methyl nitrate, bellergal, bellafolin and gynergen, etc. Supra-

renin and thiamine chloride have also been tried. The numerous operations devised for relief of this condition include Heller's myotomy, esophagogastric anastomoses, a U-shaped anastomosis between the intestine and lower esophagus, and finally posterior mediastotomy with removal of the sympathetic trunk and ganglion, as well as Adamson's denervation of the cardia and other procedures. Rupture of sutures and recurrences are the rule, however. Anesthetization of the stellate ganglion as recommended by Stoll has yielded good results in some cases. In the opinion of the writer, the best method of treatment for cardiospasm is stretching of the sphincter with a Starck dilator, which has the advantage of being short and bloodless. The dilator has 4 rings which are spread *in situ* to rupture the muscle layers. Dilatation at different levels has been found useful. A mercury tube is attached at the lower end of the dilator to facilitate orientation with the aid of the fluoroscope. The Starck dilator gives better results than other dilators. There may be a sharp but transitory pain, and in some cases sensitivity and a tendency to vomit persist for a few weeks. Of 22 cases followed up, 7 had been completely cured and 15 patients had experienced relief lasting from 1 month to 4½ years. Patients may have to avoid certain foods for a time, such as raw fruits, acid foods, bread and cottage cheese. Hard work or overheating before meals may cause a pain in the pit of the stomach or a burning sensation in the esophagus with a feeling of obstruction and occasional vomiting. In most patients symptoms recur about one year after treatment, when dilatation can be repeated with good results. Hypnosis and psychotherapy have been found of value in certain cases.

Cytologic Examination of Sediment from the Esophagus in a Case of Intra-Epidermal Carcinoma of the Esophagus. *Joseph E. Imbriglia, and Mieczyslaw S. Lopusniak, Philadelphia, Pa.* Gastroenterology 13: 457–63, Nov. 1949.

A sexagenarian with symptoms of dysphagia was suspected of having a gastric neoplasm because of roentgenologic evidence. Aspiration of the gastric contents was planned, but a 16-French Rehfuss tube could not traverse the esophageal constriction. The contents of the esophagus were aspirated and the sediment, stained according to the method of Papanicolaou, disclosed malignant squamous epithelial cells; the identity of these malignant cells was verified by the microscopic appearance of the surgical specimen of the esophagus. Esophagoscopy, which included biopsy and aspiration of secretions, was negative for the presence of malignant cells. The initial roentgen study of the esophagus demonstrated an inconstant defect; on repeated examination the defect was thought to be neoplastic. We recommend a Rehfuss tube containing additional perforations in the distal 6 cm. The tube is swal-

lowed until the metal tip reaches the esophago-gastric junction, as judged by fluoroscopic observation. With the patient in the erect position, the esophageal contents are aspirated after he sips small quantities of saline. A cytologic examination of desquamated epithelium of the esophagus is now being employed as an adjunct to roentgenologic and endoscopic examinations in suspected lesions of the esophagus. 1 reference. 5 figures.—*Author's abstract.*

Pharyngo-oesophageal Diverticulum. *S. Horowitz, Glasgow, Scotland.* J. Laryngol. & Otol. 63: 600-04, Oct. 1949.

There is doubt as to the validity of the theory of neuro-muscular incoordination in the development of a pharyngo-esophageal diverticulum.

There is full accord as to the site of protrusion and the manner in which it develops, but the assumption that the triangle of Zenker constitutes a point of weakness is disputed and it is thought that an acquired defect accounts for the herniation. Supporting this view is the fact that its occurrence in young subjects has never been reported, that most examples of pharyngeal diverticula have been found in adults past middle life, the incidence being greater in males (3:1).

The cause for the formation of the diverticula is thought to be the pressure of the lower end of the cricoid cartilage against the ridge at the 5th cervical vertebral joint, resulting in thinning of the inferior constrictor muscle and the posterior pharyngeal wall at this point. It is only after the mature development of the larynx that it is large enough to create sufficient pressure against the cervical vertebrae.

The relative position of the cricoid cartilage to the vertebrae depends on the stature of the person, the length of the neck and the degree of curvature of the cervical spine. The last named factor explains the frequent occurrence of diverticula in the elderly patient, where arthritic changes produce an increased anterior curvature, which leads to increased pressure of the cricoid cartilage against the spine. Another factor in support of this theory is that diverticula occur three times as frequently in men as in women. The male larynx is on the average one and a half times the anteroposterior diameter of the female. Men are more muscular and the larynx is consequently held more firmly in contact with the spine.

A case of a patient, aged 72, is reported who had dysphagia for several years. She was examined on a previous occasion and then only an inflamed area was found in the post-cricoid region. Histological examination at that time showed some hyperplasia of the squamous epithelium but no other abnormality. Two weeks prior to her present admission, she complained of a sudden severe pain in the supra-sternal notch. On examination a bilateral pleural effusion was found. X-ray

examination of her neck showed a roundish opacity, within which were translucencies situated just to the right of the 5th and 6th cervical vertebrae and the diagnosis of pharyngo-esophageal diverticulum was made. Direct laryngoscopy revealed a raised, red, edematous area, with an oval ulcer in its centre, which was the opening into the diverticulum. A biopsy was carried out, because of the suspicion of malignant change. Histologically however, there was no evidence of malignancy. The patient died. The post-mortem examination revealed a diverticulum, which had perforated at its lower end and had infected both pleural cavities. There was a mediastinitis and an abscess near the right lobe of the thyroid gland. It is a point of interest that the tissue changes so closely simulated malignancy on direct examination that biopsies had to be carried out. 4 plates. 1 reference.—*Author's abstract.*

Operation for Diffuse Dilatations in Initial Portion of the Esophagus. (*Zur Operation der diffusen Erweiterungen im Anfangsteil der Speiseröhre.*) *Eugen Disse.* HNO, Beih. Zschr. Hals- Nasen- u. Ohrenh. 1: 459-61, Heft 10, Aug. 1949.

Dilatations in the cervical portion of the esophagus must be differentiated from diverticula because they require different surgical treatment. A sac-like dilatation appears on both sides of the trachea, giving a broad beaker-like image. Esophagoscopy reveals a wide sac with a slit-like orifice in its anterior wall an inch or so above its deepest point. The symptoms are the same as in diverticula. A case is described in a man of 57 years, in which the Sörensen type of operation was performed, under infiltration anesthesia with an avertin base. In contrast to the roentgenographic picture of a wide beaker-like image without a pedicle, the ectasia was found to extend far down into the mediastinum to the aortic arch, the violent pulsations of which could be felt. This discrepancy between the roentgen findings and actual lesion was attributed to muscular contraction due to irritation by the contrast medium. Macroscopic examination revealed definite muscle bundles in the wall. An attempt was made to pedicle the sac and treat it as a diverticulum, but in this attempt the wall was torn. The tear was widened and the margins sutured in a circle to the external skin and a feeding-tube inserted. The ectasia above this point was then ligated. Postoperative recurrent nerve paralysis subsided after a few days. The nerve had probably been temporarily injured by traction. After 10 days, the ligated sac was not necrotic, but showed hemorrhagic infarction. The sac was resected 14 days after the first operation. The sutures of the esophageal stoma were divided in an attempt to obtain spontaneous closure of the fistula. Owing possibly to daily attacks of asthma, the fistula became permanent. During such attacks, air es-

caped through the fistula. The fistula was finally excised and the wound closed with Lambert sutures. A later roentgenogram showed restoration of a normal esophageal caliber with normal peristaltic waves. A single stage extirpation of diffuse ectasias with a broad base would seem dangerous due to the danger of an early rupture of the sutures. 4 references. 2 figures.

Simple Oesophageal Cast. *J. M. Willcox, Postgraduate Medical School of London, London, England.* Lancet 2: 417–20, Sept. 3, 1949.

Only 18 cases of this condition have been previously reported. The method of production is uncertain but the probable mechanism is believed to be a low-grade esophagitis followed by an excessive epithelial proliferation, sporadic mucosal separation, ulceration at the cardiac end of the esophagus with final invagination and expulsion of the cast.

An additional case is reported in a 40-year-old woman who first brought up an esophageal cast in 1933. She expelled 2 more during the next five years and a fourth in 1948. The same symptomatology occurred each time. A burning sensation developed behind the xiphoid process following afternoon tea and then rose to the upper sternum. An excessive flow of saliva occurred but swallowing was painful, the saliva seeming to stick about half-way down. A peculiar sensation of something turning over in her abdomen developed one-half hour later. Nothing could then be swallowed but a tube-like structure was vomited, though it remained attached to the back of her throat. She bit through the tube the first time and cut it off with scissors the next two times but the entire tube pulled away the fourth time. A little blood came up with the tube each time and about one-half pint of blood-stained fluid was vomited one-half to one hour later. She vomited daily for two weeks after the last time of bringing up the blood. Salivation continued but swallowing could not be accomplished because of severe retrosternal pain. This diminished in about two weeks and she had become normal after about six weeks.

The general health of the patient was good between the episodes—without dysphagia or dyspepsia. A general abdominal swelling developed three or four weeks before each episode but subsided when the cast was brought up. Physical examination was essentially negative and barium swallow normal in the upright and semiprone positions. Roentgenograms showed a well-marked gastric rugal pattern, normal emptying, normal duodenum, and the jejunal valvulae conniventes somewhat coarse. Wassermann and Kahn reactions were negative. Examination showed the cast to be a thin-walled tube about 8 in. long and $\frac{1}{2}$ in. wide. Its wall was covered with layers of only squamous epithelium. Sections were typical of the esophageal mucosa. There were no indications of inflammation though some of the cells were edematous.

No satisfactory etiology could be found for these seizures though 3 episodes were preceded by severe mental strain. Other more severe strains were followed by no ill effects however. 5 references. 1 figure.

Restoration of the Lumen in Complex Cicatricial Esophageal Stenoses. (*Zur Wiederherstellung des Lumens bei komplizierten narbigen Speiserohrstenosen.*) *Klaus Vogel, Kiel.* HNO Beih. Zschr. Hals-Nasen- u. Ohrenhlk. 1: 469, Heft 10, Aug. 1949.

Many methods for restoring the lumen following caustic strictures of the esophagus have been suggested. The string method can be employed only when the stricture is not too narrow. There are also some cases in which the methods usually recommended cannot be applied. A case is reported in a boy of 11 years, who had swallowed some soapstone solution by mistake and came for treatment 5 months after the accident. Recent attempts at dilatation with bougies had proved futile. The string method was also unsuccessful and finally a plastic operation was suggested. The roentgen image following ingestion of contrast medium revealed a very narrow stricture, with a diverticular distention the size of a nut in the jugular region. Palpation at this level produced diverticular sounds.

Esophagoscopy revealed a stricture at the orifice of the esophagus which would not admit even the thinnest metal probe to a distance of more than 1½ cm. Dilatation of the stricture was tried, with the aid of a narrow double-bladed forceps, which was introduced closed and then gradually opened. Then a slightly larger forceps was introduced and, proceeding in this manner, it was finally possible to introduce a very narrow tube. A diverticular sac was located but had no apparent outlet. The walls were palpated from above downward in all directions with a very fine probe. Suddenly the probe entered a small opening about ½ cm. above the base on the right anterior wall. This proved to be the continuation of the lumen. The opening was enlarged, at first with a probe, and then with a forceps of increasing caliber until a bougie could be introduced which finally entered the stomach. The child was then asked to swallow a string, which was brought out next day through a gastrostomy. Progressively larger bougies from below upward and vice versa were then passed until at last the lumen of the esophagus was restored. The diverticulum persisted but did not interfere with swallowing. This method has not to the author's knowledge been used and will permit visible dilatation of a larger number of stenoses than has hitherto been possible.

New Method of Threading an Esophageal Stricture. *Henry J. Rubin, Los Angeles, Calif.* Laryngoscope 59: 1361–64, Dec. 1949.

The author describes a successful method of passing a string through

a congenital stenosis of the esophagus in a female infant whose father, a physician, refused to permit gastrostomy or repeated esophagoscopies.

A small piece of lead foil was hammered into a piece of #3 linen "cord" until it became so enmeshed as to be incapable of separation without exertion of undue force. The distal end of the string was cut so that only one-quarter inch protruded beyond the lead marker. With hemostats, a small piece of No. 000 catgut was tied tightly to this end of the string with only the first loop of a square knot, and the other end was tied in the same manner to the tip of a No. 6 woven ureteral catheter. The inch-long catgut connected the string and catheter with temporary security. The half-tied catgut knots were cut short. Total diameter was 3 mm.

Under fluoroscopic guidance the catheter, with string trailing, was passed into the esophagus and entered the stomach. Manipulation loosened one of the half-tied knots, freeing the catheter and leaving the string in the stomach. That the catheter actually lay free was easily determined, for the lead marker no longer moved back toward the stricture as the catheter was withdrawn. Dilatation was then effected with perforated metal olive-tipped bougies. 2 figures.—*Author's abstract.*

Conservative Management of Chemical Burns of the Esophagus and Their Sequelae. *William V. Leary, Rochester, Minn.* Proc. Staff Meet. Mayo Clin. 24: 506-09, Sept. 28, 1949.

The commonest cause of corrosive burns of the esophagus is commercial lye, although there are numerous cleansing and washing preparations in general use which are capable of destruction of the esophageal mucosa. Immediately following ingestion of the substance, there is corrosion of the mucous membranes of the mouth and esophagus with severe pain. During the stage of healing the symptoms may disappear entirely. As the scar tissue contracts, the stricture is formed. Better results are obtained if treatment can be started early and formation of stricture prevented. A twisted silk thread should be swallowed and left in place as a life line. When the acute phase is over, increasingly large mercury or lead shot-filled, imperforate soft rubber catheters are passed into the stomach to preserve and enlarge the caliber of the esophageal lumen. It is important that treatment be carried on for a long period until all danger of stricture is past. In treatment of a stricture which is already formed, Plummer sounds are passed over a previously swallowed silk thread.—*Author's abstract.*

Tympanic Body Tumors in the Middle Ear. Tumors of Carotid Body Type. *Nils Lundgren, Lund Sweden.* Acta Otolar. Stockh. Fasc. 4. 37: 367-379, Aug. 1949.

Hitherto only three descriptions have been given of tumors of carotid body type arising from the glomus at the bulb of the jugular vein. The

author portrays 4 cases of his own and discusses 9 cases described by other authors under the names of different tumors, which, judging by the histological picture, ought to be classed among tumors of carotid body type. The designation *tympanic body tumor* is suggested for this type of neoplasm. The pathologic picture is characterized by the extremely slow growth of the tumor. The tumor grows from the bulb of the jugular vein into the middle ear and causes a gradual impairment of hearing and increasing tinnitus. Ear-ache and vestibular symptoms are rare. The tumor may grow from the middle ear through the tympanic membrane and will then appear in the external auditory canal as an ordinary polyp, which, like the tumor itself, will bleed excessively if traumatized. It may, however, also grow in the opposite direction and destroy parts of the cell system in the mastoid process, sometimes with consequential facial palsy, and it may spare the labyrinth but nevertheless grow into the petrous bone. It is histologically benign and has a strong tendency to recur, but it does not metastasize. On account of its tendency to recur it should be borne in mind at operation that the tumor originates from the glomus at the jugular bulb which—if radical removal is to be assured—ought to be removed or coagulated. On account of the histological picture of the tumor, one might, in selected cases, restrict the primary intervention to a radical mastoidectomy with removal of the tumor. The tendency of the tumor to return makes it absolutely necessary for the patient to be reviewed at regular intervals for a long post-operative period. 20 references. 4 figures.—*Author's abstract.*

Fracture of the Malleus. *A. Paul Keller, Jr., M.D., Chamblee, Ga.* Eye, Ear, Nose & Throat Monthly 28: 531–32, Nov. 1949.

Fracture of the malleus is not commonly encountered although recorded since the time of Ménière. Dr. D. W. Drury of Boston found only 44 cases in literature from 1857 to 1925 and he added one more case of his own. The author of this paper found no further cases up to 1948 in a review of the Quarterly Cumulative Index. Symptoms produced from fracture of the malleus usually take the form of deafness in the affected ear, vertigo, and unconsciousness. The eardrum is almost always ruptured (exception noted in a prairie dog by Hyrtl). The prognosis is good and the hearing may be partially or completely recovered in some cases. No treatment is necessary although inflation of the ear by the Politzer method may help to prevent adhesions between the fragments and the promontory. The mechanism by which the malleus is fractured is not clear. 3 references.—*Author's abstract.*

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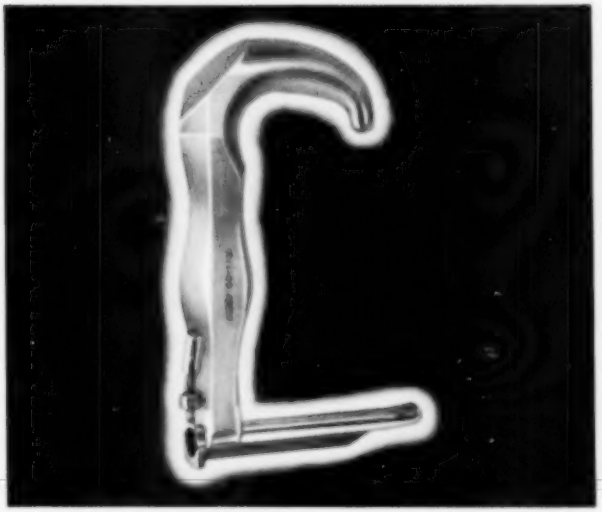

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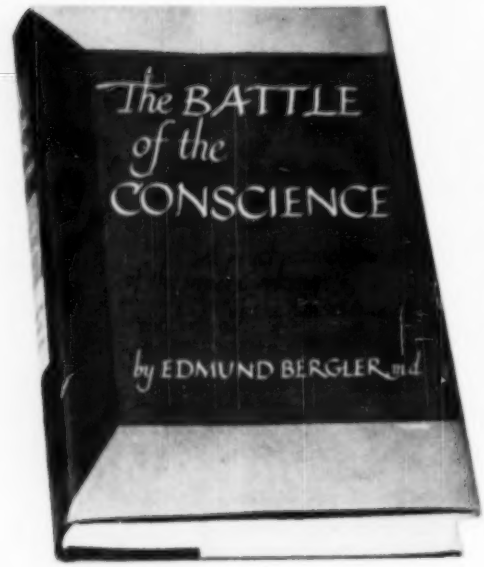

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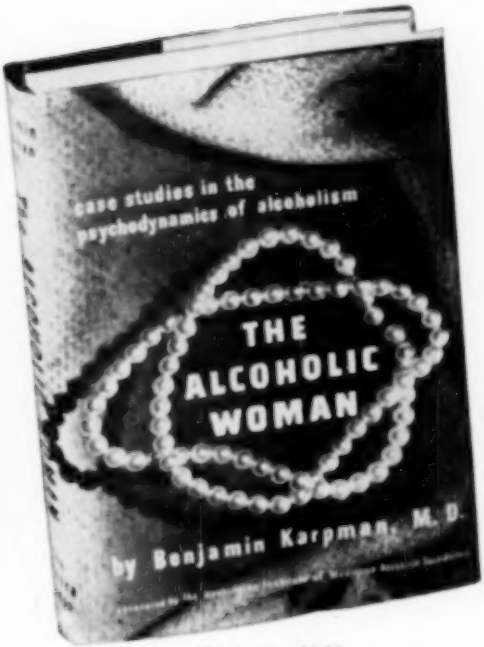

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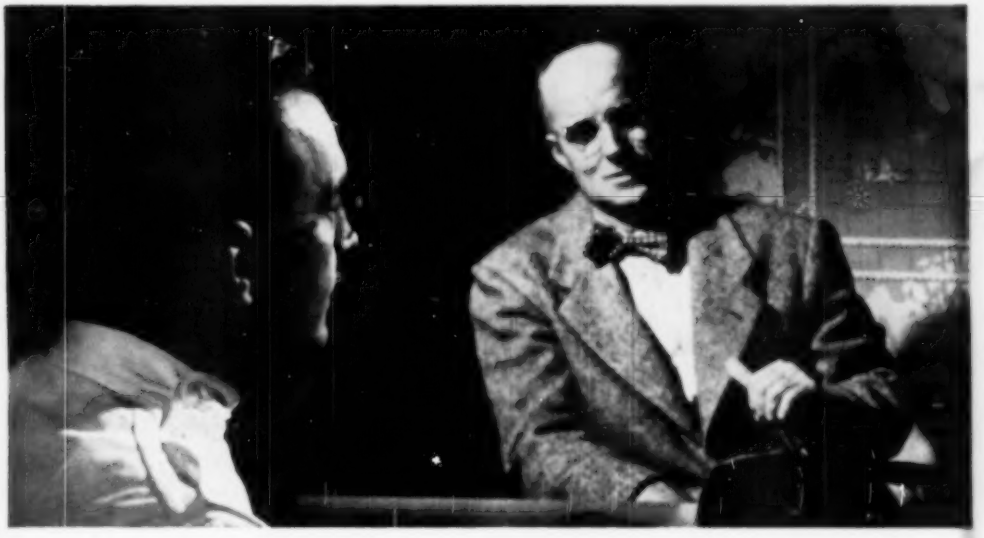

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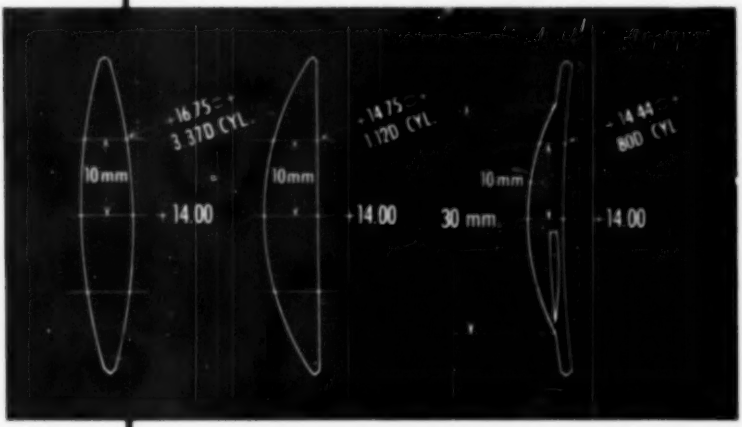

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